AMERICAN
STATISTICAL ASSOCIATION.

NEW SERIES, No. 99. SEPTEMBER, 1912

STATISTICS AT THE FOURTEENTH INTERNATIONAL CONGRESS ON HYGIENE AND DEMOGRAPHY, BERLIN, SEPTEMBER 23–29, 1907.

Summary of the Main Addresses and Discussions Before the Division of Demography.

By Walter F. Willcox, *Professor of Statistics, Cornell University.*

[A summary of the papers and discussions will interest American statisticians both because of their intrinsic importance and because of the insight they give into the condition of demography in the German Empire and to a less extent in the other countries of Europe. In view of the meeting of the same Congress at Washington September 23–28 of this year, the summary is timely as affording a means of informing the members of this Association who plan to attend that Congress, and we hope there are many such, about the last one.]

The *first* topic was *life tables*. Papers were presented on life tables for the German Empire by Rahts, for Prussia by Ballod, and for Berlin by Boeckh.

For the *German Empire* as a whole the only life table which had then been made was that for the decade 1871–80. It was prepared by Becker on the method he laid before the International Statistical Congress at Budapest (1876). This method follows every person who begins a given year of life in a certain calendar year through that year of life so as to compare the number who die during it with the number who enter upon it. The deaths to be considered are distributed through two calendar years and, if the living population for ten years is covered, the deaths for eleven years must be examined but with the exclusion of about one half of the deaths occurring in the first and last of the eleven years. For seven German states and a little over three per cent. of the population the requisite information was lacking.

Recently the Imperial Statistical Office has undertaken the preparation of similar tables for 1881–1890 and 1891–1900.

The available material is far better than that Becker had. In his day Oldenburg was the only German state reporting deaths by years of birth and years of age. For the later decades 14 of the 26 German states give this information. The number of states not giving the minimum information needed has diminished and only one per cent. of the population has now to be excluded. The method of Becker is used but with some improvements. The deaths of only ten calendar years are considered. Deaths are tabulated only by years of age, the return of year of birth being used merely to measure the influence of migration. This is important because some German states tabulate deaths only by years of age.

For each of these two decades 1881–1890 and 1891–1900 a German life table for each sex is to be computed. Other tables will be prepared for each state or group of adjoining states. Alternative methods also will be tried in order to see how the results reached by different methods agree.

Recent life tables for *Prussia* compared with those for 1859–1864, 1868–77, and 1890–91 show a notable increase in the average duration of life. This increase of vitality is most marked at ages 1–19, less marked at ages 20–54, and least noticeable at ages above 55. Separate life tables for urban and rural population reveal the greater vitality of the country folk, a difference which is marked only among males. At the ages 40–49 the advantage lies apparently with the city folk. If the case of Berlin is typical, the city-born population has the shortest duration of life. Here too male immigrants to the city show a greater advantage over the city-born than female immigrants do.

Life tables for *great cities* were treated by Boeckh, then 83 years old, in a report which he was unable to present in person. He concluded that life tables for males and females should be made for each year and that the need for them is greatest in large cities in which the population changes rapidly. The registration of all arrivals and departures from a city makes it possible to determine the population at the beginning and end of the year. All such migrants should be classified by year of birth and thus the resident population of

the city classified by year of birth determined for comparison with the decedents similarly classified.

To Boeckh's report Rahts added: No other large city except Charlottenburg has life tables comparable in accuracy with those of Berlin. In all large cities where immigrants and emigrants are accurately registered life tables should be made for each year.

In the discussion Lexis urged that all census or registration age returns should be made both by year of birth and by year of age. Seibt proposed to embody the suggestion in a resolution. Kiaer pointed out that the mortality of married men was much lower than that of unmarried men. At the age of 20–29 they were related as 2 to 3. The influence of this difference on the death rate of both classes together is marked. Wagner suggested that the mortality of groups classified by property or income was more significant than the mortality of occupational groups. The former, he thought, might be determined in Germany. Von Bortkiewicz said that the differences in average duration of life between the Prussian provinces were much less than those between the English counties. Manchester, e.g., has almost as short an average duration of life as British India. He doubted the value, scientific or practical, of annual life tables like those of Berlin.

The *second* topic was "the duration of life." A paper by Levasseur and Huber was presented in the authors' absence by March. It urged that the comparison usually made in those countries or cities for which life tables have been constructed between the average duration of life from birth should be supplemented by comparisons between the average after-lifetime at various ages. A low expectation of life at one period of life, like infancy, may coexist with a moderate or high expectation of life at other periods. A paper by Silbergleit emphasized the marked increase in the average duration of life in Berlin during the last quarter of the nineteenth century as shown by the life tables prepared each year for that city. The expectation of life at birth increased from 29 years in 1876 to 38 years in 1900; that at age 1 from 42 to 50 years; that at age 2, when it reaches its maximum, from 46 to 52 years; and each later age shows some increase in the

duration of human life. Among the causes suggested for this increase were the system of compulsory insurance, the better economic condition of the population, and the sanitary improvements which had been introduced.

In the discussion of these papers Kiaer pointed out that the underlying assumption of a constant mortality was very questionable and Hamburger that the increased duration of life in Berlin was largely due to the decreased birth rate. Von Mayr urged that historical changes in mortality should be sharply distinguished from a statement of present conditions, the latter alone being of great practical importance. Wagner thought that the great increase in length of life at Berlin was largely due to the favorable economic conditions after 1895. Von Bortkiewicz urged that death rates at the several ages were not independent variables. A low death rate at 40, for example, might of itself explain a death rate twenty years later at 60 higher than the present death rate at that age. Mayet challenged the common opinion that the decrease of total mortality is mainly due to the decrease of infant mortality. He had found that the annual death rates of infants and of the rest of the population of Berlin had varied from year to year between 1816 and 1905 in much the same way and that the decrease of mortality among children over 5 years of age had been greater than that among infants, conclusions from which Ballod and von Juraschek dissented.

The *third* topic before the section was infant mortality. It was treated under three divisions: (a) Methods; (b) Influence of food; (c) Breast feeding.

Under *methods* Prausnitz urged that comparisons between different regions in which the intervals allowed for registering a birth differed were unsafe. If that interval is long, many births of children dying before registration are likely to be registered as still-births. The difficulties in getting an accurate record of the causes of infant deaths are much more serious. To diminish them he had organized at Graz special investigations made by a physician experienced in children's diseases into all cases of infant deaths. His experience led him to believe that under exceptional conditions this was practicable. There must be a children's physician at command and he

must get news promptly of each death. Where practicable this method gives a much better basis for the study of infant mortality. His results indicated, e.g., that tuberculosis is a more common cause of infant deaths than is commonly supposed, many cases really tuberculous being returned as due to dyspepsia, atrophy, or bronchitis.

Silbergleit called attention to the difficulty of measuring infant mortality where many children were sent out of the family and perhaps out of the city to nurse, and also to the error involved in comparing the annual deaths under 1 with the births of the same year when about 30 per cent. of these deaths are of children born the year before. He also mentioned an improved method of studying monthly variations of infant mortality.

The *influence of food* upon infant mortality was examined in one address by Foth upon the supervision of the supply and distribution of milk and another by Biedert on the results of recent measures for the protection of infants, especially in France. The latter showed that the decrease was greatest in the rural districts of France and least in Paris and that apparently the decrease of infant mortality did not run parallel with the decrease of the birth rate. He laid much stress upon the influence of summer temperature and favored special local studies like those begun by Prausnitz.

Neumann had studied infant mortality in Berlin classifying the families into those occupying two rooms and a kitchen, three rooms and a kitchen, and four rooms or more, 89.5 per cent. of the births occurring among the first class, 6.0 per cent. among the second, and 4.5 per cent. among the third. The mortality of nursing children in all three classes was very low and in the poorest class less than double what it was in the highest. The mortality of bottle-fed infants was from 4 to 7 times that of breast-fed infants in the same class. His main conclusions were that the danger of artificial food became greater in proportion as the economic position was poorer, the infant younger, and the heat greater, and that the most effective means of reducing infant mortality was to increase the proportion of breast-fed children.

Landsberg presented a paper which examined carefully and skilfully the various methods of measuring the effect of food upon infant mortality. Many cities of Germany and Austria now require on an infant's death certificate a statement of the kind of food administered either shortly before its death or throughout its life. But even in Berlin on about one sixth of the certificates the question is not answered. The resulting proportions of deaths among infants fed in various ways are of little help because they are controlled largely by the variable prevalence of breast-feeding in the population. The number of breast-fed and bottle-fed children among infants living as well as those dying is indispensable. This information has been sought: (a) from the person attending the birth and for the following six weeks (Saxony); (b) from the statistics of maternity hospitals (Amsterdam); (c) from the statistics of compulsory vaccination of infants (Bavaria); (d) from the census statistics of a city (Berlin, Hanover).

Freeman presented a paper dealing mainly with the control of the milk supply in New York as a factor in the reduction of infant mortality.

Under the third sub-topic, Lange urged the importance of ascertaining the prevalence and duration of breast-feeding in various countries and their subdivisions and claimed that the method followed in Berlin and Barmen was unsatisfactory. He favored recourse to the records of midwives. Ziegenspeck considered the reasons that so small a proportion of children are breast-fed, arguing that the mode of dress tended to check the normal development of the breasts and that inability to nurse a child was inherited. On the latter point he cited von Bunge's results showing that only two daughters out of 486 born to mothers who could not nurse their children were themselves able to nurse. Among the results of bottle-feeding as stated by Röse, he mentioned defective teeth, rickets, slow growth, and more frequent incapacity for military service. Thus among 763 bottle-fed children who had reached the age for military service less than one third were able to pass the physical examination of recruits, while of 1,123 who had been breast-fed throughout the first year of life nearly one half passed the physical examination and between these

two extremes the longer breast-feeding had continued, the larger the proportion of the recruits who were up to the standard.

In the discussion on infant mortality, Neumann said that in Denmark all cows supplying children with milk were supervised by veterinarians. Tuberculous cattle were killed and the owner reimbursed by the state. A sick cow was separated from the herd and its milk no longer used. A city ordinance regulated the fatty contents of the milk, ordinary milk to have not less than $2\frac{3}{4}$ per cent. fat, skimmed milk not less than $\frac{3}{4}$ per cent., milk for children not less than 3 per cent.

Dr. Agnes Bluhm admitted that, if the duration of nursing by the mother could be reported by the midwife as Lange urged, it would be most satisfactory. But this she thought impracticable; the midwives would not do it without pay and the mothers would not like them to do it. The capacity to nurse the child is an essential factor. Current opinion on this point is too optimistic. The brilliant results secured in children's homes are not decisive for such homes have a select clientèle. The time of observation in these homes is too short to settle the question whether an average mother can nurse her child for 9 months. Probably one third of the mothers cannot supply milk so long as that.

Blenck doubted the expediency of inquiring at a census into the manner of feeding infants. There would be a wide margin of error in the answers and to ask the questions would increase the popular dislike of statistical inquiries.

Kiaer said that in Norway the infant mortality among legitimate children had diminished but among illegitimate children had increased.

Schlossmann agreed with Dr. Bluhm and rejected von Bunge's method which relied on the midwife or physician attending at the birth. The question on the death certificate should be: How long was this child nursed?

Kriege said that, the results Dr. Seutemann and he had reached having been questioned, he would give further evidence that the data furnished by the midwives were trustworthy. They preferred the statements of midwives because

the mothers might be less willing to answer. So far as possible the midwife was sent to the mother whom she had attended. They carefully tested the answers of the midwives and convinced themselves that the answers were substantially correct. The information sought was, how the child was fed at the time the midwife visited the mother.

Tönnies defended Boeckh's results, but admitted that often they were wrongly interpreted as by inferring artificial food to be the cause of the high death rate among bottle-fed infants. A child nursed by its mother usually has better care otherwise. Mothers who did not nurse their children were often weak in other ways and their children might be feebler at birth than those of nursing mothers.

Meinert said that infant mortality was decreasing and its main cause, diarrheal diseases, apparently increasing. This was an error. Diarrheal diseases were more accurately diagnosed and fewer cases were returned erroneously as convulsions.

Weinberg said that the effort to reduce infant mortality should concern itself not only with the milk but also with controlling milk substitutes and limiting their supply to the prescription of a physician. The apparent decrease in the frequency with which mothers nursed their children in Berlin had been attended by a decrease of infant mortality. This paradox was not explained by the improvement in the quality of the milk, by the decrease of marital fecundity, or by the improvement of economic conditions. On the contrary they must assume that the more recent returns were more trustworthy than the earlier ones, because the people's suspicion of census questions had diminished. The returns of midwives were still more untrustworthy because a certain proportion of them were prejudiced against the nursing of children by mothers. No one but the physician can ascertain whether children are nursed and this can be done only by personal observation. Until this return is required by law of the entire population, official statistics must be limited to indirect geographical comparisons between the frequency with which children are nursed and the rate of infant mortality. In general the physician has medical reasons for recommending the mother to nurse her child and is not restricted to the

evidence which is furnished by statistics. The careful methods employed in the Berlin statistics of infant mortality and infant food are in striking contrast with the great inaccuracy of the data.

Poetter believed that midwives could hardly be dispensed with in getting statistics of nursing. This method for three years had clearly justified itself in Saxony. To be sure, the Saxon midwives stand higher than those of Prussia and heavier demands can be made upon them. Midwives may furnish the data for statistics of nursing if they are under satisfactory control and in a city this is quite possible.

Landsberger disagreed with Meinert's opinion that the influence of hot waves in summer was anything like equal to the influence of the mode of feeding. In Dresden attention is given only to the housing of infant children, but in Leipzig great attention is given to the kind of food.

Ascher thought there was no evidence that children who were not nursed were born of weaker mothers than other children. The assumption contradicted medical experience. The tenement house question was important because in supervising illegitimate children not only the food but also the housing conditions were improved.

Hahn believed the statistics compiled by Groth and himself were as sound as those of Kriege and Seutemann. They were derived from answers by mothers and nurses given at the time of the first vaccination. The material was gathered by physicians and they are more trustworthy than midwives. The favorable effects of breast-feeding appear in the statistics of Naples, showing a low infant mortality notwithstanding unsanitary conditions. This is due probably to the prevalence of breast-feeding.

Würzburger thought the low infant mortality of Naples was due probably to the frequency of abortion rather than to the prevalence of breast-feeding. The latter he thought no more common in Naples than in other Italian cities. His conjecture was supported by the very small number of illegitimate children born in Naples.

Silbergleit argued that the census returns indicating a decrease in the proportion of breast-fed children were correct.

This decrease he ascribed to the more frequent occupation of the wife and mother outside the home.

Landsberg pointed out that the defects in the Berlin returns were found mainly in the death certificates filled out by physicians. This was one reason why the example of Berlin had not been imitated elsewhere.

The *fourth* topic before the section, registration of vital statistics, including plural births, in Germany, brought out three papers by Würzburger, Prinzing, and Lommatzsch, but neither in the papers nor in the very brief discussion of them were any points made of much interest to persons attending the present Congress.

The *fifth* topic, family statistics, was discussed by March. This subject was first investigated by private students, Sadler, Duncan, and Ansell in England and Fahlbeck in Sweden. Only within the last thirty years has it been studied by official statisticians, using census and registration records. The census sometimes reports on a single family schedule all members of a family present or absent, and sometimes the number of children born to every married, widowed, or divorced person. The death certificate of each person who is or ever has been married should report the number of children born to the marriage; the birth certificate of every legitimate child should report the number of the birth in the family.

These records give different measures of the size of the family. The death certificate gives its final size at dissolution (except for the case of posthumous children); the census schedule or birth certificate, its size before the end. A marriage duration table like that of Boeckh shows that the average duration of a marriage before ending in death or divorce is $22\frac{1}{2}$ years and the median duration about 24 years. The average duration of the married life of couples enumerated by a census is France $20\frac{3}{4}$ years, Paris $15\frac{1}{4}$ years, Copenhagen $14\frac{3}{4}$ years, Berlin $12\frac{3}{4}$ years. In theory a marriage duration table should be computed for each combination of the ages of husband and wife.

The most important use of a table classifying the married couples reported in a census by age of husband and wife is to furnish a basis for computing the birth rate or natality as

affected by age of either party, as has been done in Norway, Budapest, and New South Wales. After excluding all marriages followed by a birth in less than 9 months, an age of maximum fecundity is indicated for the wife and the husband. Such returns also reveal the proportion of sterile marriages. Sterility is in some cases physiological; in others, volitional. Paarson studied the married couples in Copenhagen classified by the number of children born to them and concluded that the number of sterile marriages was about double what the theory would indicate, assuming a regular continuity of distribution. Sterility is more common the greater the age of the wife at marriage. Among couples who have been married at least 15 years in the rural communes of France sterile marriages are only 10 per cent. of the total; in Paris they are 17 per cent., and the proportion of sterile marriages rises with the size of the city. Sterile marriages are more common also in the well-to-do classes. Thus in Paris among couples who had been married just 15 years in a worker's district 19 per cent. were childless, while of similar families in a wealthy district 29 per cent. were childless.

The statistics of families permit a more thorough study than ordinary birth statistics of the circumstances controlling fecundity. Those statistics that we now have apply to small population groups or furnish results in insufficient detail. Still they supply useful indications which should be considered in all countries where the birth rate is falling.

Aside from their interest for establishing marriage duration tables and for insurance purposes, they show what age combinations of husband and wife are most favorable to fertility, indicate the mortality of mothers and of children, and bring to light other influences acting on the fertility or sterility of marriages, such as origin, occupation, or social position.

There is a widespread opinion that the decrease of the birth rate is due to the fact that families tend to determine the number of their children at a fixed and low number. Voluntary sterility is not thought to be a cause and people are disposed to admit that one type of family, those with two children only, is becoming more common. The statistics do not confirm this impression. Perhaps the number of

childless families is increasing and the variations in the size of the families not decreasing.

The problem of population is at the base of many others. It cannot be treated suitably without precise and detailed family statistics. It is desirable that in every country birth records, death records, and census returns should furnish information regarding the number, sex, and order of birth of children, whether living or dead, regarding the date of the marriage and the age of the parents in combination with other common returns, especially birthplace and occupation.

Under the same topic Weinberg urged that in addition to the usual registration records family registers like those of Würtemberg be established. The brief discussion turned upon the wisdom of such a recommendation by the Congress and reached negative results.

Under the *sixth* topic, statistics of recruiting, Granjux and Simon presented a paper. Statistics of army recruits deal with facts of two classes. The first relates to the number of men who present themselves for examination, the second relates to those who are actually enlisted in the army.

It is the general practice to estimate the physical condition of the population of military age by the proportion of exemptions granted by the Military Board of Appeal, and the physical condition of the recruits by the proportion of later eliminations, that is, those made before the recruits depart for their post, before they arrive, or during their period of service, all these eliminations being entered as disabilities caused by the service. This is manifestly unfair, especially since large numbers of those passed by the Military Board of Appeal are really unfit and consequently are eliminated as soon as they arrive at their post.

All eliminations made by the army authorities during the first two months of service from the recruits passed by the Military Board should be classed with the eliminations made by that Board and not considered as due to the physical effects of army service. Two months are needed for the army surgeons to observe the condition of each man. A table for French recruits was given, showing the exemptions from

military service according to this plan and comparing them with figures reached according to the method now in use.

Another fact that makes statistical comparisons difficult is that orders have been issued from time to time lowering the physical requirements for military service. The physical condition of recruits is frequently taken as a measure of the physical condition of the population as a whole. It is evident that so far as the physical requirements are changed no comparisons can be made from period to period, at least not in diseases or defects affected by the change. Useful comparisons can be made only in diseases which have been recognized for all periods and in all countries as causing unquestionable disability for military service. such as tuberculosis, asthma, pulmonary emphysema, nervous troubles, etc. It is to be noticed that the prevalence of these diseases of the graver sort among army recruits may fairly be taken as a measure of the morbidity of the population as a whole or of certain sections, and may also be used for international comparisons. Minor physical defects, such as malformations or defects in sight or hearing, are not of such vital importance and are differently regarded in different countries and in the same country at different periods.

In the discussion of the statistics of recruiting, Griesbach said that there was no ground for claiming a general decrease in the capacity to bear arms on the part of the Germans and submitted a table for 10 European countries showing the per cent. of persons rejected at the military examination. Ballod said that they need have no fears regarding the present ability of Germans to bear arms, but in the future with the steady growth of the urban population there might be a marked decrease in this proportion. For example, of the persons examined in Berlin only 34 per cent. were able to bear arms, but in the eastern provinces from 65 to 70 per cent. Hesse expressed his regret that little attention was given in Germany to the statistics of recruits in other countries. Austria and Switzerland had much better statistics on this subject than Germany. Jacquart said that international comparisons in this field could be made only with the greatest caution. According to Griesbach's table Belgium and Switzerland had

a much higher proportion of persons physically unable to bear arms than the other countries of Europe. This was due, for Belgium at least, to the fact that they did not need many soldiers and in consequence the standards of the examining committee were severe. The bases for statistics in this field and the method of organizing the military service varied in the different countries so much as to prevent a comparison of the results obtained by different methods.

On topic *seven*, Dr. Feig considered the treatment of internal migration by the International Statistical Institute and the International Congresses on Hygiene and Demography and the statistical methods used by various states.

He mentioned three kinds of internal migration: (1) change of residence for considerable periods of time; (2) migration for a limited period for the purpose of securing work; (3) migration of travellers or visitors. Most of the discussion was limited to the first class. Statistics concerning them were gathered in three ways, two indirect and one direct. Until now the indirect methods have been most frequent. By one indirect method, the population increase as shown by the census is compared with the natural increase as shown by excess of births over deaths. The difference is the increase or decrease due to migration. The method has been used largely in Prussia where for each district a migration balance is made out. Of course this method does not give the number of arrivals or of departures but only the difference between them. Nor can it give other statistical data as to place, time, sex, and age. By the other indirect method census questions are asked about place of birth and date of leaving it. These together with questions concerning age, sex, and occupation give more detailed information as to the personal conditions of those who have migrated to the district where they were found.

The most satisfactory but least used method is that of direct observation. To make it possible, all persons coming into or going out of the district must be required by law to report to some official who asks all necessary questions. This compulsory registration can best be carried out in states where population registers have been maintained for some time, as Belgium, France, Holland, Italy, Finland, and Russia.

Registration of a change of residence is required in Prussia, Bavaria, Hesse, and other German states. In Switzerland permission for settling in a canton must be secured. A commune is given the privilege of requiring such registration in France, Austria, Spain, Norway, and Luxemburg.

Migration statistics can best be secured when there is compulsory registration for the whole state. But they may serve for many purposes when required only in communes, especially if the number of such communes be large. At best the figures represent a minimum. Emigration is more difficult to record than immigration. Feig closed with a detailed account of how the statistics are used in those states having compulsory registration.

In the discussion Goldstein said that the reason for internal migration, as well as for emigration, was found in the overpopulation of the country districts, where more persons were produced than the market demanded. If there was much agricultural land untilled, the rural population might increase, as land came under the plow. But if all the land was in use, population would increase only as extensive agriculture gave way to intensive agriculture demanding more labor. The rural population of Germany is stationary or decreasing. In 1871 it was 26.2 million; its maximum in 1880 was 26.5 million; since then it has steadily decreased and in 1900 was 25.7 million. The real reason for this decrease has been the introduction of agricultural machinery. The emigration from the country districts is greater than the decrease of the total population because births there exceed deaths.

Von Bortkiewicz said that the direct method of measuring internal migration (based upon registering all changes of residence) was statistically the ideal. To carry it out thoroughly seemed inconsistent with the theory of personal freedom and for many large areas this method was not in use. Statisticians will long have to use the indirect method, comparing the place of birth with the place of residence as reported by the census. The difficulty with this is that it leads to such extensive tables, even if few other elements are combined with it. This difficulty can be diminished by omitting a combination of each place of residence with each place of birth,

tabulating only whether the place of residence was the same as the place of birth or an adjacent town, county, or state, as the Austrian statistics have done so well.

Hesse said that an extension of the method of direct return was needed so as to show more thoroughly the place of origin of immigrants, especially dividing such places into urban and rural. In this way a better analysis of the question regarding the emigration from the country and immigration into the city would be possible; the amount of migration from one city to another shown; and important material furnished for the question of the longevity of the city-born population.

Under the *eighth* topic, emigration and immigration, Kiaer read a paper. Emigration is a relief to countries whose population is too dense and its general effect is to ameliorate the condition of the lower classes.

In gathering statistics of emigrants there are various places at which statistical observation may be made: (1) the place of origin; (2) the port of embarking; (3) the port of disembarking; (4) the destination of the immigrant; (5) the place where the immigrant is found by a census. The ideal method would be to gather statistics at all these points and compare the results.

In order to secure information at the place of origin the country must have a population register, and few countries have them. Of all the places of observation the best is the point at which an immigrant enters a country. By means of administrative measures the immigrant may be required to make a declaration.

The Berlin meeting of the International Statistical Institute (1903) recommended that birthplace should be stated at a census by giving the small administrative district of birth and that countries should exchange the information thus obtained. It is to be noted that in the United States where there are over ten million foreign-born it is difficult to secure information in such detail. The best place to secure this information would be at the port of embarkation.

Under the same topic Seibt read a paper upon the restriction of immigration as a means of protecting races, civilizations, or economic standards, summarizing the laws having

this purpose in view which had been adopted by countries receiving numerous immigrants.

In the discussion Neefe referred to Kiaer's proposal that every census should give the birthplace of immigrants and said it was as important or more important to give the last place of residence of those who have immigrated within the census period. Kiaer proposed questions about the cause of the emigration or immigration, and the length of stay, whether it was seasonal immigration, etc. Neefe thought it important also to inquire into the social and economic condition of the immigrants and the current of returning emigrants.

Ballod said that limitations upon immigration in order to protect the race and civilization of the receiving country are of much importance. After the abolition of slavery in Brazil in 1888 European immigration was encouraged by free transportation for the purpose of improving the stock which had deteriorated as a result of the infusion of Negro blood. In Morocco the Moorish population is much contaminated by Negro blood. As a result of recent progress in hygiene in connection with the struggle against malaria great subtropical areas which formerly had to be avoided by agricultural laborers because of this disease have been opened to the European races. Perhaps in future we shall have, in addition to the limitation of immigration in countries in which Europeans can live, the compulsory expatriation of colored people to the tropics.

Von Juraschek urged that migration was much influenced by rates for transportation, pointing out that the rate war in 1906 had greatly increased emigration from Austria-Hungary. It should further be noticed that the reduction in the time and cost of a journey often transforms migration from permanent to temporary, a fact which makes it all the more important to analyze the current of return migration. The number of foreign-born in the various countries of Europe has greatly increased of recent decades. In France alone there has been a marked decrease since 1896 and this as a result of certain regulations restricting the industrial opportunities of foreigners and facilitating their naturalization.

The papers on school hygiene and statistics (topic *nine*) by Gaspar and Oebbecke contain little of importance for the present Congress and led to no general discussion.

Under topic *ten*, occupational diseases and mortality, an extended paper was presented by Mayet, the main conclusions of which were as follows:

Morbidity statistics aim to determine how many cases of sickness and how many of each kind and each degree of severity occurred in a certain group of persons and thus how many are to be expected in future. It is not enough to know the number and kinds of cases; we must know also the number of persons in the group and relate one series of numbers to the other.

We must distinguish:

(a) Morbidity statistics showing neither the kind of occupation nor the kind of sickness.

(b) Morbidity statistics showing only the kind of occupation.

(c) Morbidity statistics showing only the kind of sickness.

(d) Morbidity statistics showing both the kind of occupation and the kind of sickness.

It is important to know of cases not producing disability as well as those that do. But in the following summary we are concerned only with the latter.

Morbidity tables should establish ratios between sicknesses and the number of persons among whom they occur.

Morbidity series tables show the occurrence of a definite number of sicknesses and measure the influence of legal provisions about the beginning and duration of relief upon the recorded days of sickness. They are therefore of importance for legislation and for insurance offices.

Morbidity-mortality tables show how many cases and days of sickness occur to each death. They permit us to infer from a known mortality the unknown morbidity of the group in which the mortality occurs.

The determination of morbidity calls for a classification of cases and members of the group by sex and age. In classifying occupations not the industry but the individual occupation is of primary importance.

To combine the two sexes in one number is erroneous. Tables without distinction of age are of little value.

It is important to distinguish the following age classes: under 15 and thereafter by 5 year age periods through 75, with a possible reduction to 6 ten-year age periods, 15–24, etc., and distinction of those under 15 and over 74. Where the groups are smaller we might make these classes: under 15, 15–34, 35–54, 55–74, 75 and over.

The occupational classification may differ from that used in occupational and industrial censuses, the former being determined by sanitary considerations, the latter mainly by economic and technical considerations. But unnecessary departures should be avoided. Occupations which one believes to be especially healthy or unhealthy should be treated separately.

The treatment of morbidity statistics is most likely to be satisfactory in the case of large sick insurance societies, trades unions, the army, and the navy. Important information may be obtained from prison officers, insane asylums, poor houses, and great steamship lines.

The enumeration of persons is most accurate provided the data show for each person: (a) the time of his paid membership; (b) the time during which he was insured, but paid nothing for it; (c) the days of sickness. These three periods together give the time exposed to risk. The sum of all the days of insurance of all insured persons divided by 365 gives the number of persons under observation for one year.

For each sex, age, and occupation the most important and trustworthy figure is the relation between the cases of sickness or of death, or the number of days of sickness, and the number of persons under observation for one year.

To compare the conditions in different occupations a large number of different tests may be used. Aside from tabulating the cases of sickness among persons not disabled thereby, the cases of sickness resulting in disability furnish the following tests: (a) ratio of the days of sickness to the days at risk; (b) ratio of the cases of sickness or (c) the days of sickness to the number of persons exposed; (d) average duration of the sickness; (e) curve of sickness according to age; (f) ratio be-

tween cases of payment, especially those involving the longest period of support, and the number of persons exposed; (g) ratio between the frequency of accidents, especially those involving long disability and the number of persons exposed; (h) ratio between the active members of an occupation and the insured members of the same occupation; (i) ratio of deaths to the number of persons; (k) ratio of deaths to the cases of sickness; (l) ratio of deaths to the number of days of sickness; (m) ratio between cases of abnormal childbirth and the number of persons; (n) ratio between the cases of abnormal childbirth attended with sickness and normal cases; (o) excess or deficiency of this occupation compared with the average in all or most of the age classes in all or most of these ways; (p) morbidity and mortality figures according to the kind of sickness.

We should strive to interpret current and new material according to these tests and in doing so a physician's diagnosis should be used. The physician should be asked to report whether the case is one of a trade sickness, an accident, tuberculosis, sexual disease, or alcoholism. In giving this report a form securing secrecy should be used. The relation of occupational morbidity statistics and mortality statistics to the length of the labor day, which the German Bundesrath may prescribe for trades endangering the health of the laborer by long hours, justifies an effort to determine by a card for each person incapacitated by sickness the relation between his sickness and his hours of labor.

No general tabulation of all morbidity data for all occupations and all kinds of sickness is to be desired but rather a selection each year of individual occupations or classes and a study of their morbidity. In such a case it is important to determine the number of persons among whom the cases of sickness occur. As an aid to securing statistics of occupational morbidity, it is desirable also to inquire into the growing material touching cases of definite forms of sickness (trade diseases).

The following conclusions were reached in a paper by von Lindheim on occupational morbidity and mortality.

The statistical study of occupational morbidity and mortality would be aided if it were the law or custom for every one

who chooses an occupation to have his physical fitness for it ascertained by a physician.

Occupational morbidity and mortality statistics are a concern of the state and to aid private students of them is a duty of the state.

In spite of the difficulty of the problem, international conferences should be held to secure uniformity in the classification of diseases and causes of death and in the classification of occupations.

In using the material at hand, it is recommended

(a) Relative to occupational morbidity, that—

1. Existing statistics of sickness, accident and disability associations, public or private, should be tabulated and published by statistical offices in a more comprehensive way than previously.

2. All sick insurance funds and hospitals, public or private, should be required to report the occupation and age according to a uniform schedule.

(b) Relative to occupational mortality. In all cases of death an official *post-mortem* examination should be required and the physician should certify the cause of death.

The task of statistics relative to occupational morbidity and mortality is not merely to help life insurance and sickness insurance; it is also important as an aid in the choice of an occupation and may be of value in diagnosing or preventing disease. This kind of statistics must leave the beaten path. It must be modern and follow the new paths which medical science has opened. It must also allow for the new occupations which have developed through technical progress and changed social conditions.

In the meantime the Congress should declare it desirable: (a) to maintain the sex classifications of all returns, even in the numerous professional occupations now entered by women; (b) to maintain a sharp distinction between factory occupations and hand trades; (c) to give a special treatment to persons engaged in transportation; (d) to ascertain the morbidity and mortality of office employees in telephone and telegraph industries; (e) to report separately the statistics of persons engaged in caring for the sick.

The discussion on these papers raised few points of interest to American statisticians.

Under topic *eleven*, the classification of statistics of the causes of disease and death, Guttstadt read a paper on the foundations of such statistics, Würzburger on the German classifications, and Bertillon on a comparison of the international and the German classifications. Bertillon pointed out that from the beginning of international gatherings at Brussels in 1853 statisticians insistently demanded uniformity in statistical work and especially uniformity in the classification of causes of death. American statisticians recognized the same need and took action in that direction more speedily than their European colleagues. The American Public Health Association decided in 1897 to adopt the classification of causes of death which had been submitted to the International Statistical Institute, on condition that it should be revised at an international gathering to be held in Paris in 1900. This endorsement of that classification was due in large part to the fact that it had been prepared in the effort to furnish titles comparable so far as possible with those of the English, the Berlin, and the Italian classifications. The requisite revision was made by an International Commission which gathered at the invitation of the French government and included delegates of 26 countries. This Commisssion not merely edited two classifications, a shorter one of 35 titles and a longer one of 179 titles; it also indicated the significance of each title by specifying the causes of death to be included under it, so as to make it perfectly definite. Furthermore it stated how deaths attributed to two causes, and this happens in about one third of the cases, should be classified.

This international classification has obtained a steadily increasing vogue. It is now employed by countries having about 200 million inhabitants and to the list might be added Italy, which has changed some of its titles in order to assimilate them to those of the international classification.

Furthermore we had much satisfaction in seeing this international classification adopted by German cities in a publication edited by the city of Cologne but later discontinued. Recently (1905) elaborate classifications have been published

by the German Imperial Health Office. Of those there are three: first, a very detailed list including 409 titles; second, an abbreviated list including 30 titles; third, a summary list including 14 titles.

As to the detailed nomenclature, it is doubtful whether a list of 409 titles can be used successfully in many countries. To print them is expensive and the list includes many which are seldom needed. Half of them would be left blank in the annual statistics of a city like Berlin, because not a single death from them would occur. This detailed list fortunately is almost entirely comparable with the international nomenclature, but the arrangement is completely different, so that any comparison between the two is most laborious. The abbreviated international list includes 35 titles and the German 30 but the two are very unlike. Hardly 9 are strictly comparable.

Under the *twelfth* topic, the relation between income and the death rate, Neefe pointed out that the problem might be attacked directly or indirectly. By the direct method the population is divided into income groups and the death rate of each group determined. By the indirect method the population is divided according to residence in small districts and the probable position of each district in income or economic welfare and also its death rate determined. Neefe preferred the direct method and suggested that wherever an income tax or a general property tax was in force a statement of the amount of the tax paid might be required on the death certificate of each taxpayer and, in default of this, in cities where housing statistics are gathered, a similar return regarding housing might be required on each certificate.

A paper of Singer touched little on the statistical aspects of the subject.

As the direct method favored by Neefe can hardly be applied to any American population, the paper by Bertillon, continuing his previous studies in which he employed the indirect method, bears a closer relation to our conditions. He said statisticians have often sought to distinguish social classes. The phrase, a social class, is vague and hard to define. Although money income constitutes the main difference be-

tween social classes, yet it is not the only difference. From this indefiniteness of the problem comes the difficulty in solving it.*

My solution is open to many objections, the weight of which I recognize. It has at least the merit of not being arbitrary. I have tried to indicate in figures the average prosperity of each district of Paris (Paris is divided into 20 districts, each of which contains between 60,000 and 250,000 inhabitants).

I do not rely upon a single measure of social condition but upon several and these give practically identical results.

(1) In 1,000 breadwinners how many are employers, employees, laborers?

(2) In 1,000 households of at least two persons, how many maid servants?

(3) In 1,000 households of at least two persons, how many men servants?

These latter two points combined with the first allow us to determine important economic distinctions.

We can estimate approximately:

(a) The number of working families.

(b) The number of families of employees or employers without a domestic.

(c) The number of families of employees or employers with a maid servant.

(d) Among the last how many have also a man servant.

This calculation divides the population of each district into four classes.

The statistics of lodgings give information of no less importance about the wealth of the population, showing how many families have more rooms than one per member, how many families have fewer rooms than members, and finally how many live in overcrowded apartments, or those with more than two members to a room. This calculation permits one to distinguish the different social classes living in each part of the city.

I have also made the following estimate: In 1,000 marriages how many are made with a marriage contract? This

*The problem has been attacked by many authors, notably: Westergaard and Rubin of Copenhagen, Fahlbeck of Sweden, Verrijn Stuart of Holland. We recall also the much earlier work of Villermé of Paris.

is a document witnessed before a notary, setting forth the property of groom and bride and the rules to which it shall be subject. If there is no contract, the fortune is subject to provisions of law which do not correspond to present needs. It is clear that the marriage contract is of no use unless the parties possess property. The frequency with which it is used in different parts of the same city indicates the proportion of families that have some means.

These ways of estimating wealth give results in close agreement. In Paris the first ten districts (the central ones) are inhabitated by a large number of well-to-do persons and a smaller number of persons of scanty means, while the other ten districts (except the rich one of Passy and a part of Batignolles) are inhabited chiefly by a population of scanty means.

I have made an analogous classification for Berlin and Vienna (for London the classification by Booth is much more difficult).

For the Tenth International Congress of Hygiene and Demography (Paris 1900) I studied the frequency of the principal causes of death in Paris, Berlin, and Vienna according to the degree of wealth of the various districts. The remarkable agreement of the results warrants the belief that they express constant and general relations.

One serious objection can be raised. The statistics were not classified by cause of death, by district, and by age. The last point is important. In the three cities (and without doubt in the majority of others) the birth rate in the poor districts is about three times as high as in the rich districts. Therefore there are many children in the poor districts, so that those districts should have much measles, infantile diarrhea, etc., even if the probability of a child's contracting one of these diseases was not greater in them than elsewhere. That objection is not as weighty as at first appears, for a classification by age, in general, does not modify greatly the order of the various districts of the same city.

Nevertheless, the statistics of Paris, since 1893, to escape that criticism, have given the number of deaths by principal causes and by age groups for each district. The result of that experience I have the honor to summarize to the Congress.

The complete tables appear in the *Annuaire Statistique de la Ville de Paris* for 1905.

Comparisons of the figures for Paris with those for Berlin and Vienna were given at the Congress on Hygiene and Demography at Paris 1900 and I shall not repeat them here. Lack of space does not permit me to reproduce the figures for the 20 districts of Paris. I shall limit myself to citing those for 6 typical districts. For each of these I will give the figures of two periods in order that the degree of constancy may be judged.

At each age the death rate varies inversely as the wealth. The mortality of the later period is in almost all cases below that in the earlier period. Parisian mortality has very greatly diminished in the last 20 years.

There is no relation between the degree of wealth and the frequency of typhoid fever. Measles occurs almost exactly in inverse ratio to the degree of wealth. Scarlet fever spares the quarters of the rich or very rich but not always those of the comfortably off. It is more frequent in the poor quarters. Whooping cough occurs almost exactly in inverse ratio to the degree of wealth. Diphtheria is much more frequent in the poor quarters than in others. The richer the district, the less frequent is tuberculosis; the poorer the district, the more frequent it is. Probably all the consequences of poverty contribute to that result; it would be hard to distinguish the part played by insufficiency of lodgings, insufficiency of food, alcoholic excesses, etc. We confine ourselves to the statement that poverty and tuberculosis are found together. The frequency of simple or tuberculous meningitis, indistinguishable diseases, is in inverse ratio to the degree of wealth of each district. In the case of cancer, the differences which separate the various districts are slight and do not run parallel with the degree of wealth. Congestion and cerebral hemorrhage affect rich districts less than poor. In regard to organic diseases of the heart, the differences which separate the districts are not great. The poor are a little more hit than the rich. Infantile diarrhea is far more frequent among the poor than among the rich. Congenital debility reaches its maximum in the rich district of the Opera; its minimum in the poor districts. This

without doubt is connected with the higher stillbirth rate in the rich districts (Verrijn Stuart has observed the same fact among the wealthy families of Holland). It is remarkable that the unfortunate women of the common people, compelled to work until the time of their confinement, give their children more strength than the daughters of the well-to-do whose existence is easier but whose education has not properly developed their muscular system. Senile debility does not vary in proportion to the degree of poverty of the districts. It is somewhat rare in the wretched Menilmontant district and somewhat frequent in the district of Luxemburg, which is, however, very comfortably off. It is true that other poor quarters and other rich quarters present very different figures.

Conclusions. Most of the principal causes of death burden the poor districts more than the rich. This is notably so of the fevers of childhood (measles, scarlet fever, whooping cough, and diphtheria), of infantile diarrhea, pulmonary tuberculosis, meningitis, congestion and cerebral hemorrhage, respiratory diseases, cirrhosis of the liver, and deaths by violence. Other causes of death, such as typhoid fever, cancer, congenital debility, and senile debility, appear not to be influenced by the degree of wealth.

A paper was presented by Dr. Hamburger on the connection between infant mortality and the number of conceptions in 1042 laborers' families in which there had been 7,261 conceptions. His main conclusions were:

1. Every conception which does not ultimately result in increasing the number of breadwinners, or persons over 16 years of age, results in an economic loss.

2. For rational statistics of population it is necessary to consider what proportion of the children conceived reach the age at which they can begin to return what they have cost.

3. The answer to this question has not been possible because the requisite returns regarding miscarriages have not been available.

4. Every premature death, every stillbirth or miscarriage seriously burdens a family, reducing the physical energy of the mother and her earning power and involving unproductive expenditures for a midwife, nursing, a burial, etc.

5. The average number of conceptions per marriage is 7 among workers and 3.5 among the rich.

6. Among children conceived in working-class families more than half die before they reach the age of 16, one third by death, one sixth by miscarriage.

7. The productivity of such marriages as measured by the proportion of all conceived who reach 16 years of age sinks regularly as the number of conceptions per marriage increases.

8. In order to maintain the population of the German Empire constant there must be 3 conceptions per marriage.

9. Under such a system the population would slowly increase: (a) because the illegitimate children, from 8 to 9 per cent. of all births, have not been counted; (b) because the rich have not been considered and their marriages show a higher proportion of survivors; (c) because the following out of such a system would increase the population of survivors by making better care for each child possible.

10. A number of conceptions such that more than one half of them fail to reach the age of 16 is harmful.

11. In struggling against infant mortality under present conditions the most effective means is a reduction in the number of conceptions. Subordinate means like the recommendation of maternal nursing, however important, must be neglected in comparison, for the regular increase in the proportion of losses, as the number of conceptions per family rises, proves that to rear their children in such cases surpasses the parents' powers.

12. The dogma of the blessedness of a very large number of children must disappear, provided that with more extensive data and more careful analysis my conclusion is corroborated that as the number of conceptions increases the proportion failing to reach the sixteenth year increases even more rapidly.

13. The state as well as the family has an interest in a marked limitation upon the number of conceptions, for the energy of the nation should not be wasted upon miscarriages, stillbirths, and living births of children who fail to reach the sixteenth year of age, and these at the present time are more than one half of all conceptions.

14. There is no danger for the state in the decrease of births, for it has been more than compensated by the decrease of deaths.

In the discussion Würzburger mentioned that the general conclusion that mortality decreases with the increase of income does not apply, at least in Dresden, to mortality in the first months of life. On the contrary, no difference between children of poor and of rich families can be traced until the fourth month after birth.

Von Bortkiewicz said that as a rule marital fecundity and mortality, especially infant mortality, decrease with increase of income. The question is whether there is any direct connection between a larger number of children and a higher infant mortality. From the point of view of method these investigations of Hamburger raise various questions. There is a chance for error in the fact that not all children were observed up to the sixteenth year. Furthermore the slight mortality among the children of women who have had only one child is largely due to the following circumstance. Dr. Hamburger got a beginning for his observations when he examined the eyes of the children. But mothers who had had only one child and had lost it by death seldom brought that child to Dr. Hamburger and this fact must contribute to make the returns for that class unrepresentative. The results reached by Verrijn Stuart and laid before the Budapest meeting of the International Statistical Institute should be compared. He examined the connection between the number of children and infant mortality in much more accurate fashion, avoiding the one-sidedness involved in Dr. Hamburger's method. Verrijn Stuart claimed that in large families the very number of children born might increase infant mortality because no satisfactory care and attention could be given to each child and, on the other hand, the death of one or more children might increase the parents' desire for more children. In general the connection between the number of children and infant mortality was treated by him more clearly than by Dr. Hamburger.

Weinberg said that all statistical material of this sort gathered by physicians involves a biassed selection, so it is desir-

able to have an investigation of an entire population. Such an investigation in the middle of the 80's was made by Geissler of Saxony and showed a relation between the number of children and infant mortality and also a relation between infant mortality and the interval between births.

Under topic *thirteen*, statistics of housing, Böhmert presented a paper on the task and methods of such statistics.

The initial question, whether the present housing statistics of Germany furnish comparable data, he was compelled to answer in the negative. Proceeding to consider the reasons for the great untrustworthiness of the statistics in this field, he found them in the lack of definite and unvarying units of measurement. For the central element regarding the hygienic and social value of a dwelling they had and could have no measure. The value of a dwelling is the result of many different factors and to reduce them to a simple and clear scale and test, such as every statistical measurement requires, is impossible. That value depends upon the number, kind, and size of the rooms, the number of occupants, the way in which the several rooms are used, the intensity of that use, that is, whether they are used only by night or also by day, whether they are used only for residence or also for labor, and the rent of the rooms. In addition to these fundamental questions there are others of great hygienic and social importance, such as the number and kind of sleeping rooms in relation to the number of occupants. Regarding air, it is not enough to measure the cubic air space per capita. Much depends upon the possibility of ventiliation and the practice of ventiliation and also upon the quality of the air admitted. Inquiry should be made into the supply of light, sanitary arrangements and water connections, how the family is made up, whether it includes lodgers as well as members of the family, children as well as adults. If there are children it is important to know whether they have a chance to play out of doors. The income and occupation of the residents are also important. One who spends his working time out of doors is less dependent upon his home. It is perhaps healthier for such a person to spend more of his income on clothing and food. In this case, as in so many others, one hygienic advantage may be bought

by a hygienic sacrifice in another direction and this is a fundamental principle in the housing question. Böhmert sums up that the statistics of city housing find their main problem not in massing huge comparable figures but in special investigations for practical, local purposes.

Pohle presented a paper on the results of housing statistics in Germany, pointing out that, aside from a few inquiries by certain states of the Empire, like Württemberg and Saxony, such statistics have been gathered only in cities of more than 100,000 inhabitants. Now that statistical offices have been gradually established in the large German cities, they have rightly regarded it as one of their main problems to gather periodic returns regarding housing conditions and to publish the results. For this reason a report on the housing conditions in Germany must be limited to the housing statistics of large cities.

The discussion upon this topic and the two papers without subsequent discussion upon topic *fourteen*, a comparison between life tables for entire populations and insurance life tables, brought out little of interest to American statisticians.

The *fifteenth* topic, statistics of accidents and of their results, was discussed by Klein who reached the following conclusions:

(1) According to German experience the frequency of accidents is best measured by the number injured to whom a first payment is made during the year, compared with the number of full laborers; that is, one three hundredth of the total number of days of labor during the year on the part of all insured persons.

(2) The older German accident statistics give this figure since 1897 for insured persons and groups.

(3) The German statistics of trade accidents for 1907 and subsequent years will determine the frequency of accidents more exactly and thoroughly by a further analysis both of the new accidents and also of the number of full laborers in the various industries. The most important improvements are:

(a) A classification of the insured industries and of the accidents by occupations and industries and district where the accident occurred.

(b) A further analysis of full laborers and of persons suffering from accidents by sex and age.

(4) The German statistics of results of accidents show their effect upon the earning power of the injured and their duration classifying them as follows: death; permanent disability, complete or partial; and temporary disability. The degree of disability is measured as less than 25, 25–50, 50–75, and more than 75 per cent. disabled.

(5) The determination of the kind of disability as well as of its degree is made for four successive years after the accident.

(6) The returns obtained from trade societies permit also a presentation of the results of the accident according to the actual condition of the person one, two, three, four, and five years after the accident occurred and so permit a survey of the duration of relief.

Schnitzler's main results were as follows:

(1) The frequency of accidents has increased, the increase appearing mainly in cases entailing a brief disability. This arouses the suspicion that the increase is due to the gradual extension of a knowledge of the law and to the more general presentation of claims for relief.

(2) Both the frequency and the severity of accidents depend upon the occupation. A trustworthy determination of occupational accident rates is impossible with the present organization of accident insurance and can hardly be carried out in future on account of the different occupations in one industry. For this reason emphasis must be laid upon a sharp distinction between the kinds of industries.

(3) The frequency of accidents increases with age and that of serious accidents increases faster than that of slight accidents.

(4) Statistics show less frequency of accidents among women, but when accidents do occur they are somewhat more severe than for men. This may be due to the fact that the women as a class work at the less dangerous occupations.

Topic *sixteen*, the decrease of fecundity, was discussed by von Juraschek who reached the following general conclusions. In almost all countries the general death rate has fallen much faster than the birth rate. This decrease in Europe during the last three decades of the nineteenth century was between

3 and 4 per thousand. This decrease can not be due to the diminished birth rate alone, since it is greater in amount, as appears from the increased excess of living births over deaths toward the end of the century. The decrease of the death rate and increase in the excess of births over deaths have affected the birth rate partly by reducing the number of marriages, partly by decreasing the desire for large families.

Von Mayr discussed the same subject, saying that birth rate figures must be studied in their distribution in time, in space, and by social classes and with a distinction between legitimate and illegitimate birth rates. The rates should be computed for women of child-bearing age. These women should be classified by age in periods not greater than 5 years. In studies of the legitimate birth rate the age of the husband as well as that of the wife should be considered.

In studying the distribution in space, it is important to distinguish small districts and to classify as between city and country or by groups according to density of population.

The study should be made with great geographical detail and the figures analyzed by social or economic classes, or, where this is possible, by nationalities or races, if possible also by religion, occupation, and economic position.

For classification according to occupation, a preliminary work is needed; viz., a determination of characteristic occupational groups to be distinguished not only in occupation tables but also in other census returns and in registration records. The determination of the suitable occupational groups should be made by the International Statistical Institute.

With reference to economic position there should be a combination between income tax data and birth rate figures. At the present time individual investigations in this direction should be attempted. In conclusion he mentioned the main points at which the returns now available need to be supplemented and also the extensions of tabulation that were needed.

Kuczynski followed von Mayr. The crude birth rate is the ratio between the number of births and the population. It varies with the proportion of women of child-bearing age

in the population. Because of this, a corrected or refined birth rate has been found by comparing the number of births with the number of women 15–49 years of age. This figure, however, is not a perfect measure of fertility. The larger the proportion of women at the middle period of child-bearing age, say 25–45, in the total 15–49, the larger the number of births.

To allow for the difference in age distribution von Mayr at the Brussels meeting of the International Congress on Hygiene and Demography proposed to adjust the birth rate for the several years of child-bearing age to a standard age composition derived from a life table, his object being to allow for differences in the influence of migrations and in mortality. This method, however, presupposes the existence of a satisfactory life table. To select a life table for some third population group is likely to be misleading. In such cases it might be well to exclude the influence of mortality entirely and compute how many births to each thousand girls arriving at the age of child-bearing would occur in each region to be studied, if the number of women of child-bearing age at each year of age between 15 and 49 was the same.

A further correction is needed to allow for differences in marital condition. This results in two birth rates, a legitimate birth rate per 1,000 married women of child-bearing age and an illegitimate birth rate per 1,000 unmarried women of child-bearing age. The differences in the legitimate birth rates of different countries are far less than the differences in the birth rate per 1,000 total women of child-bearing age. On the other hand, the differences in the illegitimate birth rates of different countries are very great. It is desirable to make still another correction by allowing for the numerous class of children conceived before marriage but born after marriage. Wherever in reporting a legitimate birth the date of the marriage between the parents is reported and tabulated (and this has been done in Austria, Berlin, Dresden, Amsterdam, New South Wales, and West Australia) a correction for such cases can be made. Among 100 first-born legitimate children those born within less than 9 months after the mar-

riage were in Dresden 43, Berlin 39, Amsterdam 34, New South Wales 27, and West Australia 20.

These legitimate and illegitimate birth rates again, like the ordinary corrected birth rate, are influenced by the proportion that the women between 20 or 25 and 40 make of the total 15–49 years of age.

The discussion of this topic was very brief and added nothing of general interest.

Resolutions adopted at the recommendation of the Section on Demography by the last two International Congresses on Hygiene and Demography.

XII. International Congress (Brussels 1903)

1. As infant mortality is of great importance for the welfare and social condition of nations and as statistics unaided cannot improve the bases for the statistics of stillbirths, this Congress desires that all governments should revise their administrative ordinances for registering births so that all births (including premature births and stillbirths) should be registered with the facts about them. Statisticians in conjunction with physicians should then in tabulating births introduce a uniform treatment of premature births and stillbirths.

2. There should be effective and general enforcement of the law requiring that the death certificate should be verified by a physician appointed by the local authority and in countries where no such provision exists it should be established.

3. Doctors should be required by law to report the causes of deaths which have occurred in their practice.

4. Until such a law is enacted there may be an unsigned declaration of the cause of death following in its main lines the Swiss system.

5. The statistical analysis of demographic returns is made by breaking them up into homogeneous groups. In order to discover these groups many details must be reported.

In editing such records and preparing for their statistical tabulation it is important to increase the number of the returns that facilitate the formation of homogeneous groups. Such records can furnish the elements of two important

ratios: first, the total fecundity of marriages measured when they are dissolved; secondly, the annual fecundity determined by the annual number of births.

6. The Congress, recognizing that heredity and alcoholism are among the principal causes of insanity, believes that active efforts should be made to spread the knowledge that marriages with inebriates or with neurotics often result in the birth of mentally defective children.

7. The Congress desires that the public authorities should perfect the organization of psychiatry and of asylums by establishing a special body of doctors expert in mental diseases whose certificates may provide the protection due to individual liberty and take the place in large degree of legal and administrative formalities.

8. The Congress desires that in every country there may be published periodical statistics of the insane whether in asylums or out. It believes that such statistics ought to be prepared even if they include only such insane as are reported to the public authorities.

9. The only means for the government to acquire precise knowledge of the danger of alcohol and the necessity for energetic measures against it is to organize a great statistical referendum by which the losses due to alcohol should be carefully analyzed. The Section on Demography urges that the form suitable for such statistics should be examined at the next session.

10. The Congress desires that the eleventh question,—internal migration; depopulation of the rural districts; growth of cities, advantages and disadvantages; causes and remedies,—should be completed as follows: (1) Definition of an urban center (the statistical unit as distinguished from the administrative unit); (2) Definitions of rural agglomeration and of industrial agglomeration.

11. The Congress believes that the practical value of demographic data would be increased if they could be separately established for the poor. The most perfect means of getting statistics of the poor would be by determining *a posteriori* the number of the poor through a census of the income of every family. This method being in many cases difficult to follow,

the method of classification *a priori* should be employed by considering as poor all those who ask relief from the public funds or from charity. Although the terms poor and pauper are not entirely synonymous, the Congress is of the opinion that the statistics of individuals aided by charitable institutions might give very serviceable returns to demography.

12. The Congress desires that an international bibliography of hygiene and demography should be established.

XIV. International Congress (Berlin 1907)

I. 1. In view of the results heretofore secured, the Congress believes that statistical officers should compute life tables for the populations classified as urban and rural and by occupation, social position, and, if possible, income, and urges the statistical officials who are present to work in that direction.

2. For computing exact life tables it is ve y much to be desired that the deaths should be classified both by decedent's year of birth and by decedent's year of age as the International Statistical Congress at The Hague in 1869 recommended.

II. The Congress desires that on the death certificates the occupation and position in the occupation should be given as specifically as possible.

III. The Congress recommends that international conferences convene periodically to promote uniformity in returning the causes of death.

IV. 1. To tabulate morbidity statistics obtained through sick insurance funds is a duty of the state; to forward private studies in this field is advantageous to it.

2. The Congress believes that states which publish morbidity statistics in connection with sick insurance funds should hold conferences to examine the details of such statistics.

V. The Congress regards the improvement of tenements as one of the most important questions affecting the public welfare. Along with efforts at improved regulations legal provisions for the oversight of tenements by the municipality are needed.

VI. 1. In order to learn exactly what regulations are needed to secure the proper hygiene of tenements and to obviate the

danger of disease due to unhealthy conditions, regular statistics of all city buildings should be prepared.

2. The influence of housing conditions on the prevalence and spread of tuberculosis in every large city should be investigated.

VIII. The Congress believes that it is practicable and important to develop the statistics of accidents in the various countries so as to make them comparable. It cordially welcomes the efforts made in this direction by the International Statistical Institute and the International Congresses on Workingmen's Insurance.

It especially desires that states which have similar systems of compulsory insurance against accident should agree upon similar methods of gathering and tabulating the statistics.

THE PERMANENT CENSUS BOARD OF NEW YORK CITY: ITS PRESENT WORK AND POSSIBILITIES FOR DEVELOPMENT.

By George H. Chatfield, *Secretary Permanent Census Board of the City of New York.*

By chapter 249 of the laws of 1908, the State of New York added a new statute to her educational laws and thereby created the permanent census boards, one for each city of the first class, namely, New York, Buffalo, and Rochester. Each board consists of the mayor, the city superintendent of schools, and the police commissioner, with an executive secretary. The board has power to appoint clerks and other employees, to fix their salaries, and to make rules and regulations for carrying out the provisions of the statute.

The specific duty imposed upon the board is shown by the following excerpt from the law:

"... said board shall always have on file a complete census of the names and residences of the children between such ages and of the persons in parental relation thereto. ... Such census shall include all persons between the ages of four and eighteen years, the day of the month and the year of the birth of each of such persons, their respective residences by street and number, the names of their parents or guardians, such information relating to illiteracy and to the enforcement of the child labor and the compulsory education law as the school authorities of the state and of such cities shall require."

The object of this new statute is to make possible a complete enforcement of the compulsory education and child labor laws. In the large cities the school authorities have of necessity concerned themselves chiefly with the children actually enrolled in the public schools, and with such other children as have been brought to their attention by various voluntary and official agencies. It is true that a biennial census was prescribed by an earlier statute, but this law had been ignored wherever possible by the larger cities and the results were disappointing. It was a comparatively easy matter for the

parents of non-attendant children who had been brought to light by such a census to again become lost to view by the simple expedient of changing their residence.

This point of view was well brought out by Associate City Superintendent of Schools, Edward B. Shallow, who, in 1906, supervised the taking of the biennial census in New York City. He says in his report for that year on the enforcement of the compulsory education law:

"Much non-attendance and truancy are caused by the migration, or shifting, of a large part of the population of the City of New York. Many people move from place to place; often two or more times within a school year. Some move out of the city, and return to another part of the city soon after. Such people may detach their children from school; then purposely neglect to place them in school again on their return to the city. The presence and residence of these children in the city is often discovered only by accident.

"A permanent school census bureau should be established where the name, age, residence and parents' name, of every child of school age, might be recorded; also all changes of residence within the city, arrivals in the city or departures therefrom and returns thereto, as well as the coming of school age of any child. Parents, house owners and agents might be compelled by law to report to a central bureau, the presence of a child of school age at any place, and the records could be corrected accordingly. No parent of honest intentions would hesitate to make known his place of residence; and the city should demand to know the residence of all others."

The statutory work of the Permanent Census Board is practically that set forth in the recommendation of Associate City Superintendent Shallow. If a registration be made such as is there proposed and as is prescribed by the statute, and if that registration be changed as the facts concerning individuals alter and as new individuals appear on the scene, it seems a fairly safe conclusion that failure to enforce fully the compulsory education and the child labor laws will not be due to lack of knowledge of the identity of the individuals affected, at least.

The new law, however, aroused no more interest than the statute which it superseded. As it was not to become effective until October 1909, a new legislative session intervened,

at which strenuous efforts were made to secure its repeal. These efforts accomplished nothing, except wasting the time designated by the statute for preliminary organization, a secretary not being appointed until November 15, 1909, more than a month after the canvass was to be made.

The task of census gathering is old enough to be carried on along well established lines. The task of registration is much more complicated, and calls for plans very different from those involved in the collection and tabulation of census statisics. While there is no question that regular census taking is planned with all possible care, it remains equally true that the public neither makes nor can make many tests of the accuracy of the results. The accuracy of a registration is constantly under fire. Whenever information is sought concerning an individual or facts are desired pertaining to a small area, definite tests are being applied.

No one connected with the organization of the work of the Permanent Census Board in New York had had experience with the problem of registration or saw clearly the possibilities of the work. The fact that the statute compelled the police commissioner to furnish the men to make the enumeration was not calculated to arouse his sympathy. Knowledge of the amount of help needed and of practically every detail involved had to be gained by experience. It was evident that the first steps should be taken slowly.

Two methods of making the enumeration were open to the police commissioner. The first and most rapid was to furnish blanks and directions to the commanding officers of precincts for the instruction of the policemen under their charge as to how the work should be done. Obviously, a large body of men could then be employed, and the work done rapidly. If carried on in this manner, however, the difficulties of securing an accurate canvass were almost insurmountable. The indifference to be expected in some quarters, the already heavy burden of police duty in busy precincts, the misunderstanding of spirit and methods in others, and the impossibility of supervising the details of work done by thousands of men changing from day to day, made it clear that for speed, the more essential features of accuracy and completeness would be sacrificed.

On the other hand, it was possible for the police commissioner, instead of confiding the work to the rank and file, to detail a body of picked men whose service should not be interrupted by police routine, and whose work could be carefully supervised and controlled by those who were directly concerned in its success or failure, namely, the census board. This meant slower progress but it also meant accurate and satisfactory work. Police Commissioner Baker finally decided in favor of the second plan and detailed four men to begin the work under the command of a lieutenant. After the work had passed the experimental stage, the number of policemen was increased from time to time. The enumeration was begun in January, 1910. From May, 1910, to July, 1911, the number of men at work varied from 56 to 60, after which it was reduced at various times until there were but 12 men employed when the initial canvass was completed in December, 1911.

So far as the lack of practical experience permitted, precautions were taken against carelessness and neglect on the part of the enumerators. The best atlases available were purchased showing the kind of building erected on each lot as well as streets and avenues. Unfortunately, these atlases were not as complete in the rural sections of the city as in the urban areas, making it impossible to determine in advance of the actual canvass, just what conditions would be met. Nevertheless, each block was numbered and described in the light of the information at hand and each enumerator in his returns was required to account for each building and vacant lot within the territory assigned to him for canvass.

Systematic individual records were kept of the work of the enumerators, and as standards of efficiency developed, the careless and negligent men were replaced by those more efficient. In the course of a few months, a regular routine developed, and the canvass proceeded in a definite way. From time to time, the returns were checked to ascertain whether all buildings had been accounted for, and personal inspection was made to discover the cause for omissions. The enumerators throughout the canvass made an average return of 100+ names a day—the highest monthly average being 111 per day, the lowest, 55 per day, when the more

sparsely settled portions of Richmond Borough (Staten Island) were being canvassed.

The numbering of the blocks presented an interesting problem. In modern hotels and office buildings, the location of a room is indicated by three or four figures—the floor being shown by the first figure or the first two figures, while the remaining figures refer to the room. The school district replaced the floor for census purposes, while in assigning the remaining figures, a regular order was followed, as far as possible, according to position of the block on the map. But in areas, where from intent or accident the streets were laid out irregularly, a few figures no longer sufficed, so that as a natural result the decimal system employed in libraries was used so far as this system was applicable. The amount of decimal subdivision required to number a block consistently often resulted in a block number with so many figures that it became impossible to write them on the map. These monstrosities were called "trailers" by the enumerators, some of whom found great difficulty in copying down the numbers of a block correctly on the census cards.

The school district, however, was found to be a very unsatisfactory unit for enumeration purposes, owing to the great variety in sizes and conditions of the different districts, the school population ranging from 6,085 in the smallest to 30,278 in the largest. The entire plan of numbering has therefore been changed and brought into conformity with the work of canvassing, filing, and tabulation. The city has been divided into 99 census districts, and these have been subdivided into sections and blocks. Six figures are employed to designate a block—the first two referring to the census district, the second two to the section, and the last two to the block. The clerk rapidly learns that block 37–28–11 is located in the south end of Brooklyn, at the northern end of the district, and the lowest westerly corner of the section. The numbering scheme expresses the fundamental outline of the work. On it the enumeration was based and checked up, returns were filed and amended, and tabulations made.

The enumeration actually began in the schools. Census blanks were made out by the teachers for each child on

register and for additional members of the family coming within the scope of the act, so far as the teachers could ascertain the existence of such individuals. These census records as received from the schools were sorted by blocks, counted, and given to the enumerators for verification. This reduced the time in which the enumeration could be taken and increased the accuracy of the results, by furnishing the enumerator with a basis for testing the information received, and by reducing the amount of writing necessary.

The enumerator was obliged to account daily for all census records received by him, and for new records which he had made. Further, he filled out a report entitled "Summary of Buildings and Families," which showed the character of each building and, if used for living purposes, the number of floors and apartments, and the name of each family living therein, with the number of children within the prescribed ages. With each family was left a statement of the requirements of the census law, and if any violation of the compulsory education or child labor laws was discovered, the fact was pointed out to the parent by the enumerator and the parent was directed to comply with the law.

The physical condition of children, if abnormal, was noted by the enumerator by checking the items "blind," "crippled," "deaf," "dumb," "tubercular," "mentally ill." Cases of neglected and destitute children, or of children cruelly treated, and of contagious disease not known to the health authorities were also reported. These cases, constituting what are known in the census office as "special cases," were reported upon in duplicate by the enumerator, and were referred at once to various officials and voluntary agencies for action.

In most cases the enumerator depended for his information upon the statements of the parent. He had no right of entry and no basis of judgment as to the truth of these statements, except more or less casual observation, although much information was given by janitors, neighbors, and tenants where undesirable conditions needed improvement. In most instances, however, the special cases reported turned out to be correct. Accurate measurement of the validity of these reports by the census board itself was impossible in the nature

of things, since once a case was referred, it remained for other officials or bodies to take action. This usually meant delay, varying according to circumstances.

After the canvass had proceeded a short time, all children below four years of age were also enumerated, in order to make less difficult the later work of amending the census.

In one class of cases, it was found that a very large number of children were omitted by the enumerators; namely, children between 14 and 18 years of age who were employed. This omission was undoubtedly due to fear on the part of the parents lest any information given concerning a working child should in some way endanger the child's position. The corrective for such cases, however, lies ready to hand in our own case. The schools furnish the census board with the names and residences of all pupils admitted or discharged, and the Board of Health provides the names and addresses of all children to whom employment certificates are granted. The following up of these cases tends automatically to render the registration finally complete.

The Borough of Manhattan was first canvassed. Only a portion of it had been completed when the Commissioner of Education, Andrew S. Draper, under whose supervision the statute is enforced, required that the amendment of the census should begin immediately in all districts where the original canvass had been completed. This seriously retarded the original canvass, but furnished a very valuable experience for carrying on the work of amendment in the future. It demonstrated that certain sections needed comparatively little attention, that others should be gone over every few weeks, and that some should be visited more frequently still. It further showed that when provided with abstracts of the records already on file, an officer could amend a district completely in from six weeks to three months, and that by concentrating attention where needed, as suggested above, a squad of from 50 to 60 men could keep track reasonably well of the changes going on throughout the city, and could thus keep the registration fairly well up to date. Again, it showed particulars in which the form of the original records could be improved.

The method followed in amendment put into the hands of the enumerator, the information necessary for the identification of individual children, rendered unnecessary the rewriting of this information when found to be correct, reduced verification to the minimum, and provided for a change in the information recorded, only as changes in the facts so warranted. Through reports on pupils admitted to the schools and discharged therefrom, it apprised him of the addresses to which families had removed within his district, and by means of the lists of employment certificates furnished monthly by the Department of Health, it indicated the additional children employed, concerning whom he was to seek further information. It provided him also with the names and addresses of families removed from the territory of another enumerator to his district and through the efforts of the State Bureau of Industries and Immigration, he had at hand the names and addresses of alien children who had come to live in New York. Not that all the details above described were embodied in the first experiments, but the plan was sufficiently developed to predict its ultimate scope. In this way, the work of amendment was limited to the bare essentials. To re-canvass the city at short intervals would be prohibitive as to cost, not to speak of the feeling of intrusion which would arise in the public mind if frequent visits were made, accompanied by a detailed catechism concerning the various members of families.

In addition to verifying the information concerning children in actual school attendance, the enumerator looks up in detail, the cases of children earlier reported as violating the compulsory education or child labor laws or non-attendant, because of physical defects, or found to be neglected or cruelly treated, and he also endeavors to keep up to date the employment records of children under 18 years of age. The enumerator who covers a definite area at fixed intervals gradually comes into possession of information that enables him to economize in effort and time and, if possessed of ordinary discretion, to reduce the friction which may otherwise tend to manifest itself. One of the dangers which a new venture of this sort

must face is the possibility of a feeling of resentment, due to irritation over needless inquisition.

The law prescribes an additional means of amendment which, unfortunately, does not take into consideration the habits and prejudices of our American public. It requires the parent or guardian of every child within the prescribed ages to notify the police at the station-house of any change of residence as follows:

(1) Two weeks before any child becomes 7 years of age, its name, residence, the name of the person or persons in parental relation, and the name and location of the school attended by the child, or of the school it expects to attend, or the reason why the child will not attend any school.
(2) The removal to another school of any child between 7 and 16 years of age.
(3) The commencement of employment of any such child, the name and business address of its employer, and the nature of the child's occupation.
(4) The new address of any child between 4 and 18 years of age, immediately upon its removal to a new residence.
(5) In the case of any child between 4 and 18 years of age who has become a resident of the city for the first time, its name, age, residence, the name of the person or persons in parental relation, the name and location of school attended by the child, or which it expected to attend, or the reason why it will not attend; if the child is employed, the name and business address of its employer and the nature of its occupation.

This feature of the law is a dead letter, only a few hundred parents having complied with it. No effort has been made to punish parents for failure to obey this part of the law.

It has been seriously proposed that house owners or lessees should be required to report directly to the census board the changes in residence of children within the prescribed ages, it being expected that within a short time such a provision could be adequately enforced. This plan, while more feasible than that which places the duty upon parents, would undoubtedly be resisted. The time is not yet ripe for such a measure, although theoretically it is an entirely practicable plan.

One phase of the enumeration has been very disappointing. This is the inability of the census office to determine from the returns whether children claiming to attend school, and so

noted by the police officer, are actually in attendance or not. It was expected that every census record received from the public schools would be signed by the teacher, and that when any such record was again signed by the police enumerator, their two signatures would show definitely that the child was actually in attendance, and that when the officer alone signed a record, the conclusion would follow that the child was non-attendant. The slow rate at which the enumeration was made caused a very considerable period of time to elapse before the original canvass was made in some sections, during which time families moved to other parts of the city and were registered for the first time by the enumerator without the intervention of the schools. Then, too, teachers failed to sign the census record at the schools, so that when the record was signed by the policeman only, it did not prove that a child claiming to be attending school was in reality non-attendant. As a matter of fact, when an investigation was made of an apparently excessive amount of non-attendance, it was found that nearly every child was actually in attendance, and the fact was then disclosed that the census record made out in the school had not been signed by the teacher. The instructions in this particular had not been observed.

Again, there is a corrective for the future through the reports which are received from the schools as to the pupils admitted and discharged, changes in facts on these reports being added to the census records on file. Reference to the file therefore will establish at once the fact of attendance or non-attendance on the part of a child whose name is returned by an enumerator. The number of non-attendants discovered as a result of the original canvass would undoubtedly have been very much greater had it been possible to list by number of school attended, the names of all children throughout the city claiming to attend school and to refer these lists to the schools for verification. The preparation of these lists was, unfortunately, too great a task for the slender office force provided to attempt.

The work of the enumerators in making the initial canvass and in the amendment of the census thereafter, while involving

no inconsiderable amount of labor, presented no specially troublesome problems. It seemed clear enough that not only would it be impolitic to attempt to ascertain the pedigree of every family anew each time an enumerator recanvassed a given territory, but that most of such work would be superfluous, since it would yield no additional information. Nor should complete records be constantly made afresh, since this would necessitate unlimited filing capacity, or the destruction of the original records. Rather should provision be made for adding new information to old records. Again, nearly all the practical experience gained during the first year related to the actual enumeration and amendment. As a result changes had been made in the forms of the census records, definite instructions had been formulated as to how the heads of families should be interviewed in order to obtain all the information desired, and areas requiring very frequent amendment, frequent amendment, and infrequent amendment had become defined.

The filing and tabulation of returns presented, however, markedly different problems from those met in ordinary census taking, owing to the necessity for amendment of the records and for the revision of tabulations. Should the original census records be filed territorially—that is, by the block or smallest unit of area, or alphabetically? If the enumerator is to make use of information already known, for the purpose of reducing the amount of amendment work, an alphabetical file becomes impracticable, as the enumerators would then receive their respective quota of names for amendment, as these names appeared in succession on the alphabetical file. Then, in the course of amendment, it might easily happen that several enumerators would meet at one house, when checking up names from their respective lists, only to separate to the farthest confines of the city, in order to locate the persons whose names next appeared on the lists.

To amend the census economically, the enumerator must be able to procceed in orderly fashion from one family to another until an entire building has been canvassed, and then to proceed to the building next adjoining. Moreover, the statistics desired for educational and other municipal purposes

become most significant when directly related to the area, large or small, whose conditions they reflect. To tabulate the census records from this point of view, it is necessary that they be filed on a territorial basis.

On the other hand, an alphabetical file is indispensable if individual children are to be located as to residence, or identified from the records. Information is constantly sought by persons entitled to receive it, concerning individual children. The residence, the only clue to the record when the filing basis is territorial, is commonly unknown to the persons desiring information, in fact, the residence of a child is the information most frequently asked for. Children themselves very often require an official transcript of the census record and when, for any reason, the process of amendment has overlooked an address, the record is difficult or impossible to find because the child, having had a multiplicity of addresses, fails to recall any but the most recent.

Again, if the census is to fulfill its original purpose,—to assist materially in the enforcement of the compulsory education law,—it should be possible to locate the residences of children who cannot be found by the attendance officers. 10,000 such cases of "lost" children had to be abandoned last year by attendance officers. Finally, only through an alphabetical file can it be made certain that all duplicate census records are discarded which otherwise might be found on file in different blocks. When identification of different records for the same individual child is established, the later records in the alphabetical file may be withdrawn and the necessary changes made in the block-by-block file. It is evident that both a block-by-block file and an alphabetical file are essential to the satisfactory development of the registration plan.

Because of the amount of work involved, the office staff was unable to prepare both the territorial and alphabetical files, and, in consequence, centred its efforts on the former. This, in itself, was a long process with nearly 1,500,000 records to be filed, but it was simple compared with the work that was necessary when amendment was begun late in October of 1910, nearly a year before the initial canvass was completed. Information was received not only from the reports of the

enumerators engaged in amendment work, but from the schools the Department of Health, and the Bureau of Industries and Immigration of the State Department of Labor. Irrespective of the changes found by the enumerators, nearly 600,000 reports are received annually from the public schools alone, concerning children admitted and discharged, while the names of approximately 40,000 children granted employment certificates by the Department of Health and of about 25,000 immigrant children reported by the Bureau of Immigration and Industries are received annually.

In most cases this requires that a census record be located in the file, an entry made upon it, and then re-filed elsewhere. Moreover, it is essential that responsibility for inaccurate filing and entries should be located in order to reduce such errors to a minimum. Hence, general access to the files must be prohibited, and either one of two methods must be followed: (1) Each clerk charged with amendment work must be entrusted with the records for a specific number of census districts corresponding to the work assigned to one or more census enumerators for the same territory, this clerk to keep the files in order, withdraw all records, make the entries, and refile new and changed records; or, (2) the work must be specialized, the filing, locating, and refiling to be the work of a few clerks and the making of entries, the work of others.

The first plan has been followed and census records for one or more districts have been assigned to an individual clerk who attends to all the work in connection with these records. The records, covering some 20,000 different blocks, occupy a large amount of space. To properly refer the vast number of reports to the particular clerks in whose districts the records affected by the changes reported are to be found, requires the intervention of several clerks, having no other duty. These clerks are furnished with locating indexes showing the number of the block on which each street number is located. To make the reports ready for reference, the block number is placed upon each and the reports are then classified by census districts and turned over to the proper clerk. Each clerk is provided with a conventionalized map or chart for each district in his charge, the blocks appearing as on a map

with the initial street numbers given for each side of the block.

All changes within a particular district reported by the census enumerator can be located at once by the clerk for that district by the use of the specially prepared chart. Changes for other districts, as shown by the fact that the residence is not on the chart for that census district, causes the records affected to be withdrawn from the files and turned over to the locating clerks who refer them to the clerks for the census districts concerned, after the proper entries have been made. In this manner, the actual work of keeping information up to date is carried on, and the records properly filed by blocks. The process is very slow and has consumed so much time that a special effort has been made to standardize the process by which the clerks perform the clerical details of the amending work. The enumerators were directed to return their records in a definite order, and the various steps by which the work of the amending clerk was accomplished were fixed in writing, given a definite order of succession, and the clerks directed to follow this order without change. Notwithstanding the efforts made it seems likely that provided enumerators' assignments are equalized, the services of one clerk will be required to keep up to date the changes reported by one enumerator and those received for the same area through the various other sources of information. Changes in the alphabetical file can be more easily made, since this file is affected only by changes of residence, or by entry to the city, or withdrawal from the city of children within the scope of the statute.

In view of the number of census records to be filed—1,500,000 in all—it was early foreseen that the requirements just described would make any system of filing a long process, so that if the work of the office were to be done effectively as well as economically, it was essential that the census record itself should meet certain conditions. These conditions were that the size of the record should be no greater than was required for clearness and permanence so that the filing area to be covered in locating a record should be as small in extent as possible. Further, it seemed that the more extended the eye

range required, the greater the tendency to fatigue, and the greater the possibility of error on the part of the worker.

The 4x6 census record card adopted is supposed to meet these conditions. It is also intended to cover the entire census record of the child until 18 years of age. Experience fully justifies the claim that the record is economical from the office point of view. It is less economical from the enumerating side. It requires the facts concerning parents to be repeated for each child when one entry should suffice; it does not make possible any detailed employment records such as are now demanded in connection with the development of vocational training and vocational guidance. For these reasons it has been supplanted by a family record card sufficient for five children, and a separate employment record card each 5 x 8 inches in size. The old individual census records will be transferred to form the needed alphabetical file as fast as the new family cards can be transcribed.

There were other reasons for the change to the family record. The withdrawal of the special detail of police enumerators will make it necessary to rely upon the regular precinct police for the amendment of the census registration, at least so far as the immediate future is concerned. As the men on patrol change each week under the three-platoon system, responsibility for amendment of the census registration will be more difficult to place, and the highest degree of simplicity in the matter and form of the work to be done must be planned for. The new blank, it is thought, meets these requirements. Information from the old records is transcribed to these blanks in duplicate, the original going to the police and the duplicate forming the basis for future tabulations and serving as a safeguard against the loss of the original.

In the tabulation of the census records, the familiar Hollerith system of punch cards has been used. While by no means as desirable as the method employed by the Federal Census Bureau, it is, however, the only mechanical means of tabulation in the market that approaches the federal plan in value. The difficulty lies in the amount of effort and time required to sort 1,500,000 punch cards into a large number of classifications, unless the number of persons engaged in sorting and

counting is nearly as great as the number engaged in punching. Because of legal restrictions as to expenditures for this purpose, only a limited number of counting and sorting machines can be rented. As a result, although the punch cards were completed for the most part more than a year ago, the sorting and counting are still far in arrears. Furthermore, when the sorting is done on the block basis, cards for units of sparse population can be sorted more readily by hand than mechanically. The following code illustrates the range of the tabulation that has been planned for:

1. HOUSE OR APARTMENT.

Not known	0
Front house	1
Rear house	2
Apartment	3
Basement or Cellar	4
Hotel	5
Institution	6
Store	7
Other lodging	8

2. YEARS THIS NUMBER.

Less than 6 mos.	0
6 Mos.– 1 yr.	1
1 yr. – 2 yrs.	2
2 yrs.– 3 yrs.	3
3 yrs.– 4 yrs.	4
4 yrs.– 5 yrs.	5
5 yrs.– 9 yrs.	6
10 yrs.–14 yrs.	7
15 yrs.–19 yrs.	8
20 yrs. or more	9

3. BIRTHPLACE OF FATHER.

Not known	00
Africa	01
Asia	02
Australia	03
Austria	04
Belgium	05
Bohemia	06
Canada	11
China	12
Cuba	13
Denmark	15
England	21
Europe	22
Finland	25
France	26
Germany	31
Greece	32
Holland	35
Hungary	36
Ireland	41
Italy	42
Japan	45
Norway	51
New York City	52
Poland	55
Porto Rico	56
Portugal	57
Roumania	61
Russia	62
Scotland	65
South America	66
Spain	67
Sweden	68
Switzerland	69
Turkey	71
Umited States (Not N. Y. C.)	75
Wales	81
Other Countries	85

4. YEARS IN U. S.
See Item 2.

5. BIRTHPLACE OF MOTHER.
See Item 3.

6. YEARS IN U. S.
See Item 2.

7. SEX OF CHILD.
Boy, 1; Girl, 2.

8. BIRTHPLACE OF CHILD.
See Item 3.

9. COLOR OF CHILD.

White	1
Negro or Negro descent	2
Chinese	3
Japanese	4
Indian	5

10. AGE.
Calculate age in years and mos. to Sept. 1910.

11. PHYSICAL CONDITION.

Normal	x
Neither	0
Crippled	1
Dumb	2
Neither	0
Blind	1
Deaf	2
Neither	0
Tubercular	1
Physically Ill	2
Mentally Ill	1
Not mentally Ill	0

12. BROKEN FAMILY.

Neither parent missing	0
Father dead or missing	1
Mother dead or missing	2
Both dead or missing	3
One or more children in institution	4

13. Number Children under 4 Years.
- None 0
- One, etc. 1

14. Number Adults over 18 Years.
- None 0
- One, etc. 1

15. Cause of Non-attendance at School.
- Attends 1
- Truant 2
- Poverty 3
- Physically Ill 4
- Mentally Ill 5
- Illeg. det. (Par.) 6
- Illeg. det. (Oth.) 7
- Inst. at home 8
- Work-No Cert. 9
- Not leg. req. to attend 0

16. Literacy.
- Under 10 years 0
- Reads English 1
- Writes English 2
- Reads other language 3
- Writes other language 4
- Over 10 years.
- Does not read 5
- Does not write 6

17. Work.
- In school or under 7 yrs. x
- Working 1
- Not working 2
- How long working.
- Less than 6 mos. 0
- 6 mos.–1 yr. 1
- 1 yr.–2 yrs. 2
- 2 yrs.–3 yrs. 3
- 3 yrs.–4 yrs. 4
- 4 yrs.–5 yrs. 5
- Over 5 yrs. 6
- Has work Cert. 1
- Has no work Cert. 2

18. Kind School Attended.
- Public Day Schools
- Kindergarten 01
- Elementary 02
- High 03
- Training 04
- College 05
- Pub. Evening Schools
- Elementary 11
- Elementary Trade 12
- High 13
- High Trade 14
- Trade 15
- College 16
- Sum. Vac. Day 21
- Sum. Vac. Evn. 22
- Parochial
- Kindergarten 31
- Elementary 32
- High 33
- College 34
- Other Church Schools 35
- Private Schools
- Kindergarten 41
- Elementary 42
- High 43
- Preparatory 44
- Trade 45
- Business or Commercial 46
- Civil Service and Examinations 47
- Corporate Schools
- Kindergarten 51
- Elementary 52
- Vocational 53

19. Occupations.
(See Occupation Sheet.)

20. Length of Employment.
(See Item 2.)

Topics

1. House or Apartment.
2. Years this Number.
3. Birthplace of Father.
4. Years in U. S.
5. Birthplace of Mother
6. Years in U. S.
7. Sex of Child.
8. Birthplace of Child.
9. Color of Child.
10. Age.
11. Physical Condition.
12. Broken Family.
13. Number Children under 4 Years.
14. Number Adults over 18 Years.
15. Cause of Non-attendance at School.
16. Literacy.
17. Work.
18. Kind School Attended.
19. Occupations.
20. Length of Employment.

Full results have thus far been produced only as to age and kind of school attended, and for employment of children 14 to 18 years of age. In tabulating the employments of children, the punch machines were not used and the tabulation was made by hand. The probable employments were selected from the United States census and new classifications added as the work progressed. Instead of the block basis, the district was taken as the unit. A 4 x 6 card was used for each classified employment and subdivided to show age and length of employment of the individual.

Cards were arranged by occupations in two groups: the most common, in numerical order, in the first group; the infrequent, in alphabetical order, in the second group. By this arrangement, the cards most frequently wanted were nearest at hand. The arrangement of the card itself made the proper space easy and quick to find, as is not the case when large tabulating sheets are used, and totals were easily obtained when a district tabulation was finished. Compilation for any group of districts was not more difficult. The work of punching tabulating cards and the tabulation of employments were done by junior clerks, for the most part under 17 years of age. Their work was checked against the original records by selecting blocks at random from the work of different clerks. More thorough revision could not be attempted.

As the tabulating cards were punched from the census records, the name and address of each child, as shown by the census record, were written on the corresponding punch card. Then, when the sorting and counting had been completed, the punch cards were filed alphabetically by blocks. This permits the amendment of the tabulating file from time to time as the facts shown on the census records change, and confines the work of preparing new punch cards to those cases in which the facts have changed. The tabulation may then be brought as closely up to date for any given area as may be desired. By a different procedure only the census records would be kept up to date so that a new tabulation, whenever made, would require the preparation of punch cards for every census record, whether the record had been amended or not since the last tabulation was made. The actual labor involved would be much the same under either plan, but the plan in use meets a difficulty that the other does not.

The possibility of bringing up to a definite date a tabulation, the basic records of which are constantly amended, has been questioned. While this objection cannot be met in the absolute sense, yet for all practical purposes the difficulty is overcome in much the same manner as is followed in the general census. By stopping amendment of the tabulating file when all known changes and additions up to a given date, through whatever source received, have been entered, until a new

tabulation has been completed, a substantially accurate result should be possible. While through repeated yearly tabulations, growth in the general sense can be shown, it will also be possible to point out the territorial origin or source of change in the child population (and, inferentially, of the larger part of the entire population); i. e., to what extent withdrawals from one area become the accessions in another, and how the deficiencies thus caused in the first area are again supplied, or what is generally comprised under the term "drift of population."

The classifications by age and kind of school attended on the block-by-block basis are easily the most important tabulations. The statistics of the employments of children under 18 years of age are also of great significance. These statistics will be prepared from year to year, in all probability. In connection with these facts, the number, amount, and kind of housing accommodations are listed for each block or smallest unit of area which gives a basis for ascertaining the rate of building growth in various sections of the city, and for making forecasts of future changes as well. The facts for the entire population, as determined from the census returns, state and federal, in five-year periods can also be related, since for the greater portion of the city, these figures have been split up by the block, more or less artificially, it is true, but still of much use for practical purposes.

In addition, maps of the various boroughs on a large scale are either in process of preparation or completed, showing the block number for each block. Here the same block numbers are used as are employed for filing the original census cards, the tabulation of such cards, and the block tabulation summaries. As a result it is possible to transfer quickly to the maps the statistics for any desired area, a concrete display that is of the greatest practical utility.

By the foregoing description, it has been intended to convey a detailed idea of the scope, organization, and methods of the Permanent Census Board. It remains to point out the results which have been reached and to indicate what appear to be the possible future developments.

In respect to the aid furnished by the census board in the

enforcement of the compulsory education and the child labor laws, for which purpose the census boards were primarily created, considerable controversy was aroused by the claim of the census board of this city, that during the period of the initial canvass—chiefly the period between April 1, 1910 and July 31, 1911—some 26,000 cases of violations of the foregoing statutes were discovered and reported to the compulsory education division of the Board of Education. The number of these cases was regarded as a reflection upon the effectiveness of the work of the attendance officers. In the opinion of the writer, it seemed quite the contrary, since no clearing-house had ever existed by which the attendance officers could work through one another, in the effort to locate children "not found" through their individual efforts. And, since 9,759 such "not found" cases were reported by the attendance officers in a single year, the 26,000 cases discovered, in a sense, merely brought to light that which was already known to exist, and in addition thereto, located many immigrant children who on taking up residence in this city never entered school at all but at once began employment and were never known to the school authorities. That of the 26,000 in question more than 8,000 were illegally employed—a large proportion being of foreign birth and only recently entering the United States —is a fact confirming this opinion.

An attempt was made to prove that the greater part of the violations reported had no basis in fact, for the reason that when the attendance officers looked up the cases of children reported as non-attendant or illegally employed, the children were actually found in school or had obtained working certificates. This criticism overlooked two important facts: First, the police enumerators, who worked in uniform, were carefully instructed in the requirements of the law and were directed whenever a violation was discovered, to notify the parents of the requirements of the law, and to warn them to comply with it. It is hardly a far-fetched conclusion that the great majority of parents so instructed and so warned made haste to comply with the law. Again, the reported violations were turned in to the census office day by day, as discovered, and except for a period of one month, were

promptly referred to the compulsory education division at a varying rate, usually between 150 and 200 a day, each case being reported on a separate card with the proper school district noted for easy reference. Unfortunately, great delay ensued in turning over the cases to the district attendance officers for action—a delay usually of several months and frequently of many times greater duration. Every possible opportunity was thus afforded the parent either to move to escape the attention of the officer, or to comply with the law.

Better and uncontroverted results were had with the cases of children reported as physically and mentally defective by the enumerators. "Tubercular" cases, both children and adults, turned out nearly 50 per cent. valid. The percentage in the cases of blind children was about the same, and cripples corresponded to the lay diagnosis of the enumerators in about 60 per cent. of the cases.

Possibly the results in locating mental defectives was most significant, although owing to the lack of authorized visitors, much of the expected results were not realized. More than a thousand such children, hitherto unknown, were reported to the inspector of ungraded classes, Miss Elizabeth E. Farrell, for investigation and action. Of the number disposed of, approximately 300 were placed in school; 225 were institution cases, that is, cases of children demanding constant personal care and mentally and physically unfit for the classroom; and 62 had moved from the jurisdiction of the school authorities. Besides these there were 151 whose physical condition was such that with the present facilities they could not be received into ungraded classes. The 300 remaining are those whose parents have not responded to the written summons to bring the children for a physical examination or have failed to carry out the instructions issued upon their first appearance. Final disposition of these cases has not been possible because the inspector of ungraded classes lacked official visitors to follow up the parents until the children were placed in school or otherwise cared for.

For the most part, the conditions revealed in the cases found by the census enumerators were so much worse than those met with through the ordinary school channels, that

marked impetus was given to the movement for closer and more extended supervision and care of mentally defective and feeble minded children. Steps were taken to urge upon the Legislature the passage of a law whereby feeblemindedness such as would justify permanent custodial restraint might be determined judicially in a manner similar to that pursued in cases of suspected insanity. And finally, needed support was afforded to a plan for the reorganization and extension of the work in charge of the inspector of ungraded classes—a plan by which provision is to be made for an increased supervising force, additional examining physicians, official visitors, and clerical help.

Where children were found living in neglected or destitute circumstances or appeared to be ill-treated, such cases were promptly referred to the Societies for the Prevention of Cruelty to Children, and to the charitable organizations. This phase of the work was less significant than expected, owing to the fact that the enumerators made only a single visit and obtained the information by hearsay, rather than direct observation. Nevertheless, the work actually done was highly effectives For the same reason—the lack of authority to enter an apartment—it was impossible to present any data on two question. of great interest and importance: (1) The extent of overcrowding in the congested parts of the city; (2) the extent of child labor in the tenements.

The statistics of the work on special cases as just described are presented below.

SPECIAL CASES REFERRED TO DEPARTMENT OF COMPULSORY EDUCATION, DURING 1910 AND 1911.

Physically ill		3,724
Illegally detained by parent		6,216
Illegally detained by other persons		99
Immigrant		1,973
Truant		1,087
No working certificate (boys) 14–16	3941	
" " " (girls) " "	2903	6,844
Graduate, no certificate		1,384
Not in evening school		4,515

Instructed at home	603
Evidence of age lacking	289
Poverty	102
Total	26,836

Children Physically or Mentally Ill.

Children suffering from physical or mental disability and not receiving, so far as known at the time of reference, proper care and instruction were reported to the number of 3,557 and were distributed as follows:

Tubercular	676
Contagious disease, not attended by physician	61
Infantile paralysis	192
Mentally ill	1,117
Deaf	314
Blind	228
Crippled	969

134 new cases of adult tuberculosis were also reported to the Board of Health raising the total of cases thus sent to 3,691.

In 400 families, 770 cases of children suffering from parental neglect or cruelty have been reported to the societies for the prevention of cruelty to children and in 477 families, 1,013 cases of destitute children were referred to the charitable organizations. It is much to be regretted that the parents of children living in unsanitary home conditions cannot be reached. Numerous cases of this sort developed in the early part of the canvass but neither the tenement house department, the board of health, nor the children's society had jurisdiction, so long as the law was otherwise formally obeyed. Because such work was fruitless no attempt was made in the latter part of the canvass to record these cases of unsanitary housing.

It is to be expected that greater effectiveness in the discovery of special cases will result as the technique of enumeration improves and as the individual enumerators become more initmately acquainted with the conditions existing in their respective districts. That the interest of the enumerator in such work will continue may be safely predicted, since the

discovery of such cases is a matter of special credit and affects most favorably the service record of the enumerator, thus providing a sufficient and compelling motive for his activity.

It has already been pointed out that in two particulars the initial canvass was disappointing: First, possibly two-fifths of the number of employed children between 14 and 18 years of age were not enumerated, owing to the fear of parents that the positions held by the children would become endangered by the giving of such information. Apparently, 140,000 children in the employed class were enumerated, out of what is estimated to be a maximum of 250,000. It is probable that equal numbers between 14–16 and 16–18 were omitted, children between 14–16 requiring employment certificates, while for those above 16 years of age, a certificate is not necessary. If the 50,000 omitted between 14–16 contains as many thousands working illegally, as did the 55,000 now on file, the number of children working illegally probably ranges from 16,000 to 20,000.

It would, however, have been vain to expect any other result in the first canvass, and it is equally probable that with persistence on the part of the enumerators and through the information received from the schools concerning pupils discharged, from the Board of Health as to children granted employment certificates, and from the Bureau of Industries and Immigration as to immigrant children taking up residence in this city, as each year passes, the list of employed children will become more and more complete.

Again, inability on the part of the office staff, owing to the amount of work involved, to ist by number of school attended the names of all children reported by the enumerators as attending school, prevented the reference of these names to the schools for verification and, without doubt, allowed large numbers of children to escape the attention of the attendance officers. The fact of a permanent registration affords the means for meeting this difficulty in the future. The receipt from the schools at weekly intervals of the names of all children admitted, transferred, and discharged provides a complete list of children attending school, thoroughly up-to-date, at least so far as the public schools are concerned, by which the

question of the alleged registration of a child in school can be promptly tested.

The reports received from the schools as to pupils admitted and discharged consume a very large portion of the available energy of the office force. Not only must accurate records be kept as to the number of blanks of various sorts sent out to the schools, but the numbers received in return must be counted, recorded, and compared with the totals similarly reported each month to the City Superintendent of Schools. This requires examination of the reports of 500 schools monthly. The attempt to bring the number of census reports into exact correspondence with the reports of the schools resulted in many discrepancies for the last fall term, which have only just been remedied, and caused much additional labor and more or less friction with numerous persons who were sure they did not make mistakes.

These reports in connection with the amendment returns, aside from their value in the enforcement of the compulsory education and the child labor laws, as earlier discussed, will ultimately form a basis for determining with greater accuracy the financial needs of the schools in respect to the teaching staff required—needs which are now decided as well as may be from a consideration of the registration of previous years—a method which would be more accurate if the number of children to appear in each grade could be calculated with reference to the school concerned for each block or smallest unit of area. This involves a consideration of growth in the next yearly period which, in turn, involves consideration of the drift of school population and the construction of housing accommodations, as well as of the growth of business and manufacturing interests.

The application of census statistics to the support of speculative financial schemes is so common as to be always expected. On the other hand the use of such statistics for testing the validity of various proposed municipal expenditures is a comparatively recent development for New York City, and a development that has been useful principally because considerable masses of population are to be dealt with. Among the first, if not the first, to utilize the general census

statistics for such purposes was Mr. Alanson T. Briggs, counsel to the New York Library Foundation who, through his studies of the drift of population, was able to recommend the selection of sites for the Carnegie libraries so as to satisfy best the future needs of the public.

In 1911, the Board of Estimate and Apportionment felt that a similar application of the census statistics of the adult and school population should be made to determine in what particulars the request of the Board of Education for an issue of some $10,000,000 of corporate stock for the purchase of sites and the erection of school buildings was justified. The census board was finally asked to submit its data and any other facts obtainable to the Board of Estimate and Apportionment with such recommendations as would indicate the conclusions that seemed to follow from such data.

It was impossible to cover the entire city at the time, but with the exception of a portion of the Borough of Queens, the great majority of the individual requests for appropriations were considered. Maps were prepared on a scale of 200 feet to the inch, and on each block was shown the number of children actually in attendance in elementary schools. The schools were shown also, and their seating capacity and register designated. Taking into consideration the physical barriers, artificial or natural, which tended to restrict the directions in which children might go to school, the children living in the blocks adjacent to a school were assigned to that school until its seating capacity was reached. So far as possible, the school was made the centre of the area from which its pupils were drawn, but poor location of buildings in the past compelled frequent departure from this ideal.

As one school after another was filled to its capacity the territory being continuously assigned so that odd blocks were not left unconsidered and unrelated there gradually emerged the area for which school accommodations were lacking. By adding together the number of children resident in the various blocks of unassigned territory, the extent of the accommodations needed was easily determined, and the proper location of the new school buildings was pointed out. Similarly, where the size of the school population showed that

the request for additional school accommodations was not warranted, the fact at once became evident and the proper recommendation was made. Some changes in the recommendations would probably have been made, had it been possible to consider the matter of growth, as well as the actual school population existing, but owing to the limitations of time, such data as were available could not then be gathered completely, and the facts as to the child population were, of course, presented for the first time and afforded no basis for comparison. In several disputed cases, settled nearly a year later, this basis did exist and was a potent factor in the conclusion. The net result of the report was that in The Bronx, where the population is at present increasing more rapidly than in the other boroughs, the study made by the Census Board indicated that additional provision for 2,500 children should be made, above the amount asked for by the Board of Education—a conclusion which was upheld by the action of the Board of Estimate and Apportionment. In Brooklyn and Queens, requests for five schools were denied because the evidence submitted did not justify the appropriations. The interest on the funds thus denied, for a single year, was sufficient to pay the entire cost of conducting the census work—something in excess of $100,000.

For the current year, a similar report has been made more in accord as a whole, with the conclusions of the Board of Education. One of the more striking features is that a relocation of sites has been recommended in several cases as more likely to serve the community to advantage, and that earlier requests, again renewed,—as well as new requests, have been shown to be unnecessary. It has been more practicable also to bring into play the factor of growth as shown by comparison with the school population figures, block by block, for the previous year and by a study of the changes in registration in the various districts and schools during a period of five years.

The lack of sufficient police enumerators to bring the work of amendment up to date made resort to other methods necessary in the preparation of the block-by-block figures for the current year. Where the school registration for a given

area had not changed from that of the preceding year, the block-by-block figures were assumed to be constant and were again employed, provided no material changes had taken place in the housing accommodations or in transit facilities. Where the registration had increased or decreased, the admissions and discharges as reported from the schools, were related to the blocks concerned, the number of admissions to the schools from a given block being added to the total elementary school population of that block for the previous year, and the number of discharges from school for the block subtracted from the total. The final figure gave the elementary school population for the block for the current year. Of course, such a method ignores changes of residence of pupils, without change of school attended, but the assumption seems warranted that there would be no substantial difference because of this.

Where the census had been completed but a few months, as in parts of Queens and Richmond, adjustment was made by providing for the admission to school of the five and six-year old children who would then have entered school. When compared with the pupils actually reported on register at the time when the report was made, the block-by-block census figures obtained as above described corresponded closely with the actual school registration. It should be borne in mind that in referring to the school population, only the children attending public elementary schools were included, pupils attending other schools having been excluded by proper selection from the "Age Tabulation by Kind of School Attended." There is little doubt that as the tabulated returns by blocks for children and buildings are made from year to year, studies in growth will constantly become more accurate, and the resulting recommendations will consequently be more and more valuable.

A small study in the field of additional high school accommodations has also been made for the Borough of The Bronx. The Morris High School is the only high school located in that borough. The number of pupils in elementary schools between 14–18 years of age, as compared with the number of high school pupils of the same age were distributed among various small

areas, arranged according to proximity to the Morris High School, and related to the total elementary school population of the several small areas. The fact was again demonstrated in this borough that for certain portions of the population, attendance at high school diminishes as the walking distance from the high school increases and that a new high school placed at the lower end of The Bronx would thus serve that part of the population to whom additional carfares were matters of moment, and would meet equally well the needs of those who provide their children with secondary instructions irrespective of distance or expense. It had been intended to bring into definite relation a consideration of the factors of length of residence, specific age, nationality, and occupation of parents, and to make similar studies for the remaining boroughs in order to reach more positive conclusions concerning the growth and character of high school attendance. Pressure of time and incomplete data prevented the study from exceeding the limits above described.

The block-by-block statistics have also proved of use in connection with agitation for increased playground and park facilities in various parts of the city. The more extensive use of such statistics as an aid in demonstrating the need, or lack of need, as well as the proper location of various municipal improvements can be safely prophesied. Indeed, their use by the Public Service Commission as an aid to the proper relocation of a railroad station is but a single example.

The original census records are also being used with increasing frequency as official proof of age in the matter of the issuance of employment certificates. In no city of the state is documentary proof of age insisted upon with more rigidity in this connection than in the city of New York. The requirements of the statute are most precise and fix the exact order in which various forms of documentary evidence may be received—the birth certificate being required unless it is definitely shown that it cannot be obtained. The result of this insistence was that in the year 1911, in 85 per cent. of the cases, the birth certificate was obtained. Those who cannot furnish this or other documentary evidence are obliged to wait 90 days, in order to satisfy the authorities that proper

effort has been made to obtain it. In such cases the census record is now accepted and is called for with increasing frequency. Beginning in February, the census certificate has been furnished in 95 cases, while no record could be found in 11 cases. The inability to issue this record does not always mean that the census record was not made, but that the child is unable to give the proper residence at the time the record was made by the enumerator.

There are in every great city and elsewhere, numbers of persons to whom at times it is a matter of the greatest importance to be able to establish their identity in some official way. These suffer disappointment and loss—are unable to qualify for positions or examinations because of the lack of official identification. There will undoubtedly be greater and greater demand for the census records for such purposes as time passes. The tracing of persons, through the location of their children, would already have assumed large proportions had the census office been in a position to perform such work by means of an alphabetical file, constantly amended. Numerous requests, for reasons the most various—as may be readily inferred—have been made, but for the most part have been denied. The pathetic conditions revealed in many of the cases have made the inability to help peculiarly distressing. It seems possible that in the not distant future, the census board will be in a position to render the desired assistance.

Vocational training and vocational guidance are terms which for some time past have been frequently on the lips of those specially interested as pioneers in such matters and of others who believe that the school curriculum should be more intimately adjusted to the needs of the pupil, particularly in aiding him to meet the necessity of earning a livelihood. The vocational field is one in which generalization is a special danger, since it is in itself the expression of an endeavor to escape from the bond of opinion, so common in educational affairs, and to meet actual conditions of life with accurate adjustments.

In the City of New York, the data gathered and tabulated by the Permanent Census Board appears to have unusual

significance. The data concerns nearly 140,000 workers between 14 and 18 years of age, classified as to age, total length of employment, number of different positions and particular occupation at the time of enumeration. The most striking feature is the relatively small representation of workers in skilled trades even among those between 16 and 18 years of age. If the years between 14 and 18 years are not to serve as the period of initial training essential to the development of skill in the earlier years of maturity, it may well be asked when such training is to be expected and how the transfer to skilled occupations will be made.

The following tabulation, which is presented without detailed discussion, appears to show at least, that careful consideration of the industrial field must precede any thorough-going development of vocational training:

OCCUPATIONS HAVING MORE THAN 10,000 WORKERS.

Occupation.	Totals.				Grand Totals.		
Years employed	14	16	16	18			
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Total.
Housework	1	8,693	1	9,583	2	18,276	18,278
Errand Boys and Girls	6,366	661	6,163	561	12,529	1,222	13,751
Clerks	2,122	795	7,023	2,191	9,145	2,986	12,131

OCCUPATIONS HAVING MORE THAN 5,000 WORKERS.

Office Boys and Girls	3,551	667	4,442	1,109	7,993	1,776	9,769
Helpers	1,807	577	3,144	793	4,951	1,370	6,321

OCCUPATIONS HAVING MORE THAN 1,000 WORKERS.

Machine Operators	367	1,236	859	2,380	1,226	3,616	4,842
Packers and Wrappers	331	1,453	727	2,106	1,058	3,559	4,617
Idle	1,793	34	2,053	73	3,846	107	3,953
Stenographers and Typists	115	563	471	2,681	586	3,244	3,830
Salesmen and Saleswomen	201	605	1,088	1,823	1,289	2,428	3,717
Not Known	877	471	1,440	898	2,317	1,369	3,686
Messenger	1,117	156	1,358	79	2,475	235	2,710
Stock Boys and Girls	364	388	1,003	863	1,367	1,251	2,618
Bookkeepers	107	222	717	1,142	824	1,364	2,188
Dressmakers	—	605	2	1,384	2	1,989	1,991
Seamstresses	—	587	—	1,105	—	1,692	1,692
Feather Workers	13	551	32	1,050	45	1,601	1,646
Shirt and Waist Makers	33	421	90	919	123	1,340	1,463
Millinery	6	436	11	984	17	1,420	1,437
Wagon Boys	433	—	920	—	1,353	—	1,353
Telephone Operators	59	223	161	844	220	1,067	1,287
Outer Clothing Workers	57	228	204	645	261	873	1,134
Paper Box Makers	73	354	192	495	265	849	1,114
Drivers	251	—	853	—	1,104	—	1,104
Printers	278	9	751	36	1,029	45	1,074
Tailors	159	88	613	178	772	266	1,038

OCCUPATIONS HAVING MORE THAN 500 WORKERS.

Embroidery	29	310	62	483	91	793	884
Cash Boys and Girls	93	407	63	231	156	638	794
Cashiers	18	169	78	529	96	698	794
Bookbinders	72	202	130	325	202	527	729
Servants	14	273	32	362	46	635	681
Machinists	139	1	445	—	584	1	585
Neck Wear	11	114	50	349	61	463	524
Vendors	202	15	284	13	486	28	514
Artificial Flowers	21	161	225	298	46	459	505

OCCUPATIONS HAVING MORE THAN 100 WORKERS.

Occupation.	Totals. Years Employed. 14 Boys.	14 Girls.	16 Boys.	18 Girls.	Grand Totals. Boys.	Girls.	Total.
Hairdressers	1	119	3	374	4	493	497
Out-door Work (unskilled)	150	10	322	12	472	22	494
Leather Workers	85	70	213	117	298	187	485
Plumbers	119	—	357	—	476	—	476
Electricians	78	—	378	—	456	—	456
Folders	17	173	24	207	41	380	421
Hat, Cap and Bonnet Workers	40	92	130	158	170	250	420
Labelers	39	158	37	172	76	330	406
Laundry Workers	12	127	50	216	62	343	405
Tobacco and Cigar Makers	25	91	49	240	74	331	405
Box Makers	47	81	102	147	149	228	377
Jewelers	84	20	232	36	316	56	372
Newsboys and Girls	186	4	179	3	365	7	372
Examiners	8	105	46	183	54	288	342
Painters	71	11	246	13	317	24	341
Cleaners and Sweepers	69	41	163	53	232	94	326
Confectioners	22	103	55	143	77	246	323
Bell and Hall Boys and Girls	126	2	192	1	318	3	321
Carpenters	83	—	222	—	305	—	305
Grocery Clerks	59	17	196	25	255	42	297
Musical Instruments	91	8	176	20	267	28	295
Nurse Girls	—	185	—	110	—	295	295
Underwear Workers	7	69	9	192	16	261	277
Sorters	25	115	38	96	63	211	274
Button Workers	32	51	93	90	125	141	266
Butchers	72	—	191	1	263	1	264
Waiters and Waitresses	28	45	78	109	106	154	260
Hair Goods Workers	35	44	74	94	109	138	247
Bottlers	28	60	71	87	99	147	246
Novelties	29	56	52	95	81	151	232
Barbers	65	—	161	—	226	—	226
Pressmen	51	2	163	8	214	10	224
Glove Makers	4	110	5	105	9	215	224
Checkers	25	81	58	56	83	137	220
Mechanics	39	—	178	2	217	2	219
Weavers	23	65	24	89	47	154	201
Elevator Boys	15	—	166	—	181	—	181
Fur Workers	17	14	83	66	100	80	180
Iron Workers	54	—	122	—	176	—	176
Musicians	15	11	73	60	88	71	159
Brass Workers	32	6	91	19	123	25	148
Bootblacks	70	—	77	—	147	—	147
Bakers	47	4	84	10	131	14	145
Engravers	25	7	103	9	128	16	144
Porters	29	—	114	—	143	—	143
Instructors	8	17	19	96	27	113	140
Gold and Silver Workers	30	16	63	26	93	42	135
Government Employ	17	—	117	1	134	1	135
Pipe Makers and Polishers	41	11	61	20	102	31	133
Card and Picture Mounters	14	32	24	61	38	93	131
Amusement Performers	4	11	46	68	50	79	129
Braiders	7	32	20	69	27	101	128
Corset Makers	1	27	7	93	8	120	128
Lithographers	38	2	76	11	114	13	127
Telegraph Operators	10	20	41	44	51	64	115
Paperhangers	18	—	89	—	107	—	107
Solderers	29	5	69	3	98	8	106
Dyers and Cleaners	6	24	26	48	32	72	104
Nurses	—	42	—	58	—	100	100
Draftsmen	23	—	77	—	100	—	100

OCCUPATIONS HAVING LESS THAN 100 WORKERS.

Occupation.	Totals.				Grand Totals.		
	Years Employed.						
	14	16	16	18			
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Total.
Collectors	16	6	72	3	88	9	97
Suspender and Garter Makers	11	19	22	38	33	57	90
Ushers	18	2	64	1	82	3	85
Dippers	2	35	5	41	7	76	83
Masons	24	—	57	—	81	—	81
Umbrellas	6	7	43	25	49	32	81
Designers	9	7	42	23	51	30	81
Rubber Workers	14	15	22	25	36	40	76
Plasterers	19	—	54	—	73	—	73
Wood Polishers	26	2	37	8	63	10	73
Belt Makers	10	13	20	29	30	42	72
Timekeepers	13	7	39	12	52	19	71
Blacksmiths	17	—	50	—	67	—	67
Stonecutters	20	—	45	—	65	—	65
Artists	3	6	29	24	32	30	62
Feather Dusters	1	28	3	28	4	56	60
Compositors	12	—	45	2	57	2	59
Upholsterers	15	1	35	4	50	5	55
Hat and Bonnet Framers	4	6	18	28	22	34	56
Ornaments	13	4	11	25	24	29	53
Agents	9	2	29	12	38	14	52
Lampshades	8	5	22	16	30	21	51
Photographers	11	3	31	6	42	9	51
Trunks	7	1	26	11	33	12	45
Buyers	1	7	11	25	12	32	44
Liquors	1	—	39	2	40	2	42
Window Dressers	8	1	28	1	36	2	38
Comb Workers	6	7	12	13	18	20	38
Hostlers	6	—	24	2	30	2	32
Corset Examiners	—	4	3	22	3	26	29
Models	1	3	2	23	3	26	29
Coppersmiths	8	1	19	—	27	1	28
Decorators	1	10	10	7	11	17	28
Dentists	10	1	15	2	25	3	28
Librarians	5	4	13	5	18	9	27
Manicurists	—	3	—	23	—	26	26
Lawyers	7	—	17	—	24	—	24
Bead Workers	2	5	1	15	3	20	23
Lamplighters	7	—	15	—	22	—	22
Tassel and Fringe Workers	3	7	1	11	4	18	22
Foreladies	—	—	—	13	—	13	13
Varnishers	3	2	6	2	9	4	13
Conductors	—	—	12	—	12	—	12
Embossers	2	—	3	2	5	2	7
Mattress Workers	—	—	2	—	2	—	2
	23,864	24,295	42,756	41,057	66,620	65,352	131,927

A later phase of the census work, already approved but dependent upon provision being made for additional enumerators, is the investigation of the principal occupations above listed, to determine the conditions of work which characterize the various industries as a whole, and the opportunity for future advancement—this information to be supplied to principals and teachers in printed form so that the suggestions made to children as to employment may be founded on an accurate basis of fact.

The expense of carrying on the census work for the current year is $37,097 exclusive of the salaries of the police enumerators which are paid by the Police Department. During the initial canvass, the cost for this service was in excess of $70,000. At present, the cost of police service cannot be accurately ascertained but since for the future the amendment of the census is to be made from precincts as a part of police routine, this expense may be disregarded. In subsequent years, it will probably be necessary to employ a special body of enumerators—at least 50 in number, at an annual expense of something under $50,000. This, with an increase in the office staff—which will be necessary if the work is to be done systematically—will bring the yearly cost of maintaining the census office up to approximately $100,000.

The appropriation of money for securing and classifying information is hardly ever a popular idea with those in control of the purse strings. However, the value of the work done by the application of census statistics in the matter of additional school accommodations was so clearly recognized by the Board of Estimate and Apportionment, that funds for enumerators were willingly granted last year only to be withdrawn later because of legal obstacles which are likely to be surmounted in the future. When the money saved to the city by the prevention of the erection of a single needless school building is sufficient to pay the expenses of the census work for an entire two years and more, it hardly seems necessary to argue that the fundamental purposes of the statute in respect to the enforcement of the compulsory education and the child labor laws, in and of themselves, are a satisfactory warrant for the money expended, although it is true that only by a still

greater outlay of money can these purposes be fully attained.

In his discussion of the "Efficiency of City School Systems," Dr. Bachman submits three general tests: First, as to how many of the school population actually receive the instruction offered by the system; second, what proportion of that instruction as measured by attendance is received by those enrolled; and, third, what is the quality of the instruction given? He mentions a fourth and final test which cannot be applied, since it is a measurement of the instruction received in terms of the pupil's success in life. These criteria are not substantially different from those applied in modern business, to the conduct of great enterprises. But only in recent years, and then largely because of necessity, have the schools begun to realize that the employment of such standards of judgment is not subversive of intellectual freedom and pedagogical initiative. The money spent for public education has become the largest single item in the rapidly mounting budgets of towns and municipalities, with no sign that demands will decrease. Consciously or unconsciously, the schools have assumed responsibility not for the transmission of a mere quantum of knowledge but for education in a large sense, for development mental, moral, and physical, and for success in life, in every direction. The public is asking an accounting for this responsibility. The business man complains that the character and qualifications of the children of the public schools seeking his employment are unsatisfactory; the citizen complains of the irreverence of youth for authority and its lack of respect for property rights; the newspapers deplore the increase in juvenile delinquency and crime; official investigations of large city school systems multiply in number —all indicative of a feeling in the public mind, vague and indefinite in character, that the schools are not in harmony with the times.

What has the schoolmaster to offer in rebuttal? There is rarely a community of large size in the land that knows whether all its children are enrolled in school, that knows to what extent those who are enrolled receive instruction regularly, or the expense involved in repeating instruction for those who by neglect or intent are irregular in attendance. It has no

evidence as to the success or failure of those who leave school and, indeed, has little definite knowledge of the conditions in actual life which these children must meet—in consequence, the criticisms have been difficult to meet, except by unconvincing generalization. The knowledge of the critics is no more accurate, and no thorough-going reforms will result from reliance on mere opinion.

The census board has already demonstrated that many of the school population do not receive instruction, and as its work is more fully developed, it will present an accurate basis for determining how many of the school population are actually in attendance at school. Through its repeated amendment of the registration, it brings to notice the large majority of those who avoid attendance through a change of residence, and those whose identity has remained unknown, the immigrant and others becoming residents of the city for the first time, and the helpless and the defective child. Through the accumulating information gathered concerning the employments of children, it furnishes valuable data concerning the conditions and opportunities for employment of the untrained child, and will later be able to present equally valuable data concerning the presumptive success in life of the product of the schools, as shown by the nature and character of the occupations of children during the earlier formative years between fourteen and eighteen.

In ascertaining the validity of requests for funds for increased school accommodations, its statistics have already been a potent factor, and with the lapse of time, they will aid in a more accurate determination of growth as well. By the use of these same statistics, the estimate for the budget as to the need for an increased teaching staff can be prepared with increased precision.

These statements present the quantitative and economic possibilities of the work of the permanent census board. Its purely human side is not therefore to be ignored. When one contemplates the vast number of children who each year in the city of New York take up the responsibilities of life, or become the victims of their environment at an early age, it seems clear that the responsibilities which the state so easily

assumed for the mental, moral, and physical development of the child have been as easily put aside. Last year, 40,000 children under 16 years of age received employment certificates; 12,000 children were convicted in the Children's Court; approximately 25,000 immigrant children took up residence in the city; nearly 10,000 children could not be located by the attendance officers and disappeared from view; and more than 25,000 children were graduated from the public schools, for the most part to receive no subsequent training.

Is it too much to assume in view of the possibilities of disaster that lie within these numbers, that it is the duty of the state not to lose sight of the individual child but to remain cognizant of his separate identity from early childhood until he shall have reached that promise of happy maturity expressed through the ability for self-support, and further, to aid in the attainment of such an end through the possession of an accurate knowledge of the conditions against which the individual child must contend? It is in the spirit of these duties that the work of the permanent census board is conceived.

THE MORTALITY OF THE WORKMEN'S SICK AND DEATH BENEFIT FUND OF AMERICA.

By Edward H. Koniger.

The name of the Workmen's Sick and Death Benefit Fund indicates its object: the payment of sick and death benefits. The death benefits amount to one uniform payment of $250. The sick benefits amount to from $6.00 to $9.00 a week for 80 weeks. The admission to membership is subject to a satisfactory medical examination. Assessments are payable monthly.

Sometime ago I had occasion to investigate the mortality conditions of this association. It has been in existence since 1885; but the records of the first four years being incomplete, the investigation was started with the year 1889. From 1889 to 1909, 48,990 men and 8,166 women were members of the association; 39,255 membership certificates were still in force on the policy anniversaries in 1909; 14,156 certificates had lapsed for non-payment of the assessments; 3,745 members had died. The total risks aggregated 419,123 policy years, making an average duration of 7 years 4 months for each certificate.

Some of the principal results of the mortality investigation are shown in the following table:

TABLE A.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
Age attained.	Mortality per Thousand *during* first 5 years of Insurance. Men and Women.	Mortality per Thousand *after* first 5 years of Insurance. Men and Women.	Aggregate Mortality per thousand Men.	Aggregate Mortality per thousand Women.	Aggregate Mortality per thousand Men and Women.	Graduated aggregate Mortality per thousand Men and Women.	Number Living.	Number Dying.	Complete expectation of life.	Age attained.
18	4.070	.....	4.630	2.358	4.070	.....	.....	.....	.....	18
19	2.971	.....	3.132	2.413	2.971	.....	.....	.....	.....	19
20	4.561	.....	5.042	2.735	4.561	3.591	100,000	359	42.6	20
21	4.693	.....	5.041	3.200	4.693	4.113	99,641	410	41.8	21
22	4.524	.....	4.622	4.054	4.524	4.270	99,231	424	40.9	22
23	6.074	4.310	5.882	6.250	5.944	4.165	98,807	411	40.1	23
24	3.382	6.662	3.960	2.765	3.770	4.000	98,396	394	39.3	24
25	4.284	6.135	4.150	6.793	4.550	3.988	98,002	391	38.4	25
26	3.553	4.013	3.161	6.258	3.625	4.060	97,611	396	37.6	26
27	3.738	5.648	3.885	5.121	4.069	4.349	97,215	423	36.7	27
28	4.768	6.655	5.214	4.676	5.132	4.703	96,792	455	35.9	28
29	5.155	5.160	5.312	4.323	5.156	5.047	96,337	486	35.1	29
30	4.942	5.245	4.996	5.131	5.017	5.430	95,851	520	34.2	30
31	4.315	5.503	4.519	5.270	4.639	5.685	95,331	542	33.4	31
32	5.941	5.573	5.565	7.203	5.830	5.933	94,789	562	32.6	32
33	6.391	5.944	6.310	5.887	6.242	6.171	94,227	581	31.8	33
34	5.905	8.296	6.855	6.310	6.766	6.460	93,646	605	31.0	34
35	6.449	8.021	7.133	6.696	7.061	6.816	93,041	634	30.2	35
36	6.502	7.988	7.276	6.320	7.118	7.258	92,407	671	29.4	36
37	7.017	9.336	8.372	6.306	8.031	7.726	91,736	709	28.6	37
38	7.611	9.097	8.594	6.757	8.290	8.143	91,027	741	27.9	38
39	6.998	9.071	8.062	7.596	7.984	8.541	90,286	771	27.1	39
40	7.342	9.119	8.285	7.842	8.212	8.837	89,515	791	26.3	40
41	8.433	9.798	9.056	9.581	9.142	9.075	88,724	805	25.5	41
42	8.302	10.579	9.727	8.640	9.548	9.401	87,919	827	24.8	42
43	9.040	9.868	9.846	7.804	9.512	9.920	87,092	864	24.0	43
44	8.493	10.155	9.785	7.848	9.474	10.486	86,228	904	23.2	44
45	8.328	12.129	11.136	8.419	10.707	11.324	85,324	966	22.4	45
46	11.861	13.143	13.712	7.560	12.739	12.311	84,358	1,039	21.7	46
47	11.830	14.376	14.587	9.169	13.741	13.316	83,319	1,109	21.0	47
48	14.290	16.245	17.095	10.506	16.068	14.290	82,210	1,175	20.2	48
49	13.611	16.700	17.734	9.601	16.470	15.319	81,035	1,241	19.5	49
50	.....	16.657	17.379	12.658	16.650	16.282	79,794	1,299	18.8	50
51	.....	18.479	18.688	17.221	18.470	17.231	78,495	1,353	18.1	51
52	.....	17.247	18.170	11.619	17.236	18.391	77,142	1,419	17.4	52
53	.....	18.070	18.598	14.764	18.065	19.777	75,723	1,498	16.7	53
54	.....	23.073	23.068	22.989	23.057	21.273	74,225	1,579	16.1	54
55	.....	24.859	24.935	24.348	24.859	22.986	72,646	1,670	15.4	55
56	.....	22.360	22.574	20.882	22.360	24.859	70,976	1,764	14.7	56

57	.....	28,136	28,350	26,316	28,136	26,887	69,212	1,861	14.1	57
58	.....	33,988	34,961	26,786	33,988	29,045	67,351	1,956	13.5	58
59	.....	24,187	24,681	20,000	24,187	31,568	65,395	2,064	12.9	59
60	.....	33,445	36,250	10,309	33,445	34,390	63,331	2,178	12.3	60
61	.....	34,942	29,795	78,125	34,942	37,503	61,153	2,293	11.7	61
62	.....	33,708	34,483	.....	33,708	40,930	58,860	2,409	11.2	62
63	.....	59,140	65,476	.....	59,140	44,694	56,451	2,523	10.6	63
64	.....	33,613	36,697	.....	33,613	48,546	53,928	2,618	10.1	64
65	.....	66,667	72,484	.....	66,667	62,531	51,310	2,695	9.6	65
66	.....	104,167	108,696	.....	104,167	56,670	48,615	2,755	9.1	66
67	.....	90,909	.....	.....	90,909	61,049	45,860	2,800	8.6	67
68	.....	.....	.....	.....	.....	65,462	43,060	2,819	8.1	68
69	.....	.....	.....	.....	.....	70,878	40,241	2,852	7.7	69
70	.....	.....	.....	.....	.....	77,278	37,389	2,889	7.2	70
71	.....	.....	.....	.....	.....	85,005	34,500	2,933	6.8	71
72	.....	.....	.....	.....	.....	94,093	31,567	2,970	6.3	72
73	.....	.....	.....	.....	.....	104,540	28,597	2,990	6.0	73
74	.....	.....	.....	.....	.....	115,535	25,607	2,958	5.6	74
75	.....	.....	.....	.....	.....	124,987	22,649	2,831	5.3	75
76	.....	.....	.....	.....	.....	135,554	19,818	2,686	4.9	76
77	.....	.....	.....	.....	.....	146,521	17,132	2,510	4.6	77
78	.....	.....	.....	.....	.....	157,768	14,622	2,307	4.4	78
79	.....	.....	.....	.....	.....	170,756	12,315	2,103	4.0	79
80	.....	.....	.....	.....	.....	186,048	10,212	1,900	3.8	80
81	.....	.....	.....	.....	.....	203,702	8,312	1,693	3.5	81
82	.....	.....	.....	.....	.....	221,267	6,619	1,465	3.3	82
83	.....	.....	.....	.....	.....	240,395	5,154	1,239	3.1	83
84	.....	.....	.....	.....	.....	257,574	3,915	1,008	2.9	84
85	.....	.....	.....	.....	.....	272,094	2,907	791	2.8	85
86	.....	.....	.....	.....	.....	284,952	2,116	603	2.6	86
87	.....	.....	.....	.....	.....	300,250	1,513	454	2.4	87
88	.....	.....	.....	.....	.....	310,895	1,059	329	2.3	88
89	.....	.....	.....	.....	.....	329,224	730	240	2.1	89
90	.....	.....	.....	.....	.....	363,856	490	178	1.8	90
91	.....	.....	.....	.....	.....	407,763	312	127	1.6	91
92	.....	.....	.....	.....	.....	458,648	185	85	1.4	92
93	.....	.....	.....	.....	.....	543,680	100	54	1.1	93
94	.....	.....	.....	.....	.....	664,404	46	31	0.9	94
95	.....	.....	.....	.....	.....	835,534	15	13	0.6	95
96	.....	.....	.....	.....	.....	1,000,000	2	2	0.5	96

Column 2, in comparison with column 3, indicates a considerable degree of care in admitting new members. Columns 4 and 5 show that the mortality of the men was higher than the mortality of the women, with the only exception of the age period 23 to 33. If it were not for the numerous deaths from childbirth (30), from cancers of the generative organs (35) and from other diseases caused by the generative function (about 40), the death rate of the women in this association would have been lower throughout than that of the men.

Column 7 represents the graduated mortality of the Workmen's Sick and Death Benefit Fund, evolved from column 6. The lack of sufficient material at the lower and the higher ages suggested the attempt to find a standard table that showed a close relation to the actual mortality of the Workmen's Sick and Death Benefit Fund. The American Experience Table and then the O^m Table were tried without satisfactory results. The H^m Table, if we multiply it by 1.3190643 and subsequently deduct .00475755, serves the purpose very well, as the following table shows:

TABLE B.

Ages.	Actual Deaths of the Workmen's Sick and Death Benefit Fund.	Expected Deaths. (Modified H^m Table.)
20–29	307	290.9
30–39	1,160	1,176.1
40–49	1,613	1,617.0
50–60	621	617.0
Total	3,701	3,701.0

The membership of the Workmen's Sick and Death Benefit Fund consists of a homogeneous class of people: all members belong to the workmen's class, the great majority live in the northern part of the United States, their economic status is very similar, and the age of entry is between narrow limits—17 and 45. Indeed, the mortality table derived from the records of the Workmen's Sick and Death Benefit Fund can be considered to represent the typical mortality of the insured workman in the United States during the period from 1889 to 1909. Therefore, it is interesting to compare it with the

mortality of a class of people that occupy a somewhat different economic status, such as the Standard Industrial mortality, the New Fraternal Congress, and the Royal Arcanum Mortality.

TABLE C.

Age.	Workmen's Sick and Death Benefit Fund Table.	Standard Industrial Table.	New Fraternal Congress Table.	Royal Arcanum Table.
20	3.59	6.91	5.00	4.74
25	3.99	9.52	5.20	4.94
30	5.43	11.60	5.56	5.31
35	6.82	12.99	6.15	5.95
40	8.84	14.65	7.17	7.01
45	11.32	17.35	8.87	8.82
50	16.28	21.64	11.44	11.85
55	22.99	28.46	15.71	16.96
60	34.39	39.22	22.75	25.54
65	52.53	56.13	34.39	39.85
70	77.28	82.47	53.65	63.34
75	124.99	112.97	85.48	95.43
80	186.05	183.80	138.09	140.43

The members of the Industrial companies are, as a whole, on the lowest economic level of the classes of people whose mortality Table C represents. Their premiums are small and collected weekly. In the Workmen's Sick and Death Benefit Fund the members are of a higher grade. Their assessments for both death and sick benefits are paid monthly. The Fraternal Societies are of a still higher economic status. Their amount of insurance is rarely below $1,000, and rises to a maximum of $5,000.

A glance at Table C shows at once that the Industrial table gives the highest mortality; the Workmen's Sick and Death Benefit Fund Table is somewhat lower, and the mortality of the New Fraternal Congress Table and of the Royal Arcanum is much lower still. The New Fraternal Congress Table and the Royal Arcanum Table are very similar.

If we call the mortality of the Workmen's Sick and Death Benefit Fund 100, then the mortality of the Standard Industrial and of the New Fraternal Congress Tables is as follows:

TABLE D.

Attained Ages.	Workmen's Sick and Death Benefit Fund.	Standard Industrial.	New Fraternal Congress.
20	100	192	139
25	100	238	130
30	100	214	102
35	100	190	90
40	100	166	81
45	100	153	78
50	100	133	70
55	100	124	68
60	100	114	66
65	100	107	65
70	100	107	69
75	100	90	68
80	100	99	74

The low mortality of the Workmen's Sick and Death Benefit Fund at the youngest ages is due principally to the influence of selection. Up to age 22 inclusive all risks of this association are not more than five years old; in other words, they all passed a satisfactory medical examination within five years. From ages 23 to 30 there were 244 deaths, 176 of which occurred during the first five years of insurance; that is, probably over three fourths of the risks were from 1 to 5 years old. Although the Standard Industrial and the New Fraternal Congress Tables also are aggregate tables, they are, between ages 20 and 30, much less influenced by medical selection.

Aside from the irregularity at the young ages, the mortality of the Workmen's Sick and Death Benefit Fund is about 50 per cent. higher than the mortality of the fraternal orders. On the other hand, the Industrial Table shows a mortality twice as high as that of the Workmen's Sick and Death Benefit Fund at the young ages, 50 per cent. higher at the middle period of life, and a gradually decreasing excess later on until the excess disappears entirely at very old ages.

What explanation can be given of the different death rates of the above tables? Man is largely a product of his environment which influences and shapes his life from the cradle to the grave; it determines the nature of the life he lives and therefore determines also, to a large extent, the length of his individual life. Inasmuch as environment is largely influenced by the economic condition of the individual, the economic

condition is one of the potent factors lengthening or shortening human life.

Poverty shortens life; for poverty means a poor quality and often insufficient food, poor air in crowded habitations, overwork, lack of leisure and recreation, and little or no attention in case of illness.

A comfortable economic condition means ample food of good quality, a healthful rotation of work and recreation, comfortable home surroundings, and needed attention in illness.

Yet, by no means does the average length of life increase with a change from comfortable surroundings to affluence and wealth; for wealth often leads to over-indulgence in the pleasures of life, and to a life lacking healthful mental and physical exertion. Wealth at times also leads to another extreme: overwork in assuming great responsibilities.

Many years ago, in his book, "Influence of Selection," Actuary McClintock referred to the higher mortality of persons insured for large amounts. Since then insurance companies have produced considerable evidence pointing in the same direction.

The saying, "A short life but a merry one," seems to apply more or less to those possessed of large means; on the other hand, poverty tends not only to a short life but also to one deprived of pleasure. The longest life seems to be the lot of the one who combines abundant physical and mental work and obtains a financial return for his exertions sufficient to insure to him the comforts of life. To what extent the duration of life is influenced by surroundings is well illustrated by the Workmen's Sick and Death Benefit Fund and the New Fraternal Tables. The complete expectation of years of life under these tables compares as follows:

Attained Ages.	Workmen's Sick and Death Benefit Fund.	New Fraternal Congress.
20	42.6	45.6
25	38.4	41.8
30	34.2	37.8
35	30.2	33.9
40	26.3	29.9
45	22.4	26.0
50	18.8	22.2
55	15.4	18.5
60	12.3	15.0
65	9.6	11.8
70	7.2	9.0
75	5.3	6.6
80	3.8	4.6

We note that there are three years of life lost on the average by each member of the Workmen's Sick and Death Benefit Fund as compared with the members of the Fraternal Societies, owing to the difference in the economic status.

A study of the death causes also reveals the bearing which the economic condition has upon length of human life. Let us consider deaths from tuberculosis. Tuberculosis, one of the curses of the human race, especially of the poorer stratum of society, is usually a reliable indication of a high or low mortality from all causes.

For the period from 1896 to 1900 the Prudential Life Insurance Company reported 23 per cent. of the deaths in the industrial branch as due to tuberculosis.* Of the 3745 deaths of the Workmen's Sick and Death Benefit Fund 21.2 per cent. were caused by tuberculosis; for the New Fraternal Congress, Dr. Porter, a few years ago, reported the death rate from tuberculosis as 14.8; while such a comparison of deaths from tuberculosis cannot be very precise because the basis of computation is not identical and because age groups are not compared with corresponding age groups, yet the decrease of the tuberculosis death rate is so pronounced as we go from the lower to the higher economic levels, that it cannot fail to be impressive.

Another significant feature is the suicide death rate. 260 men of the Workmen's Sick and Death Benefit Fund, or 8 per cent. of all the men who died, committed suicide. Includ-

* For this comparison the Prudential tuberculosis death rate—23—is low, owing to the large proportion of children policyholders.

ing also the suicides among women, 12 in all, brings the percentage down to 7.26. This suicide death rate is over twice as great as the suicide death rate experienced by the regular line life companies. Looking for a cause we note the well known fact that an average workman is poorly remunerated at his prime of life and after he reaches the age of 40 he may find it very difficult to obtain employment at all. Thus, in spite of many years of great productiveness, of great usefulness, he is often driven to despair and suicide, especially so when he reaches the stage of life at which he is considered old and less useful than his younger and stronger brother.

It is a pity that our civilization has not yet advanced to the stage when a useful, productive life receives, as a matter of course, abundant reward not only during the years of greatest productiveness, but also during the later years. Such a reward could easily be the lot of all, in view of the great facility with which a superabundance of all material necessities of life could be produced, if only the enormous productive forces of the present time were intelligently, concertedly, co-operatively applied for the benefit of all.

Let us hope that the wasteful, crushing, competitive warfare in industrial life will in the near future be looked upon as a relic of barbarism.

NOTES AND REVIEWS.

RESULTS OF THE RUSSIAN CENSUS OF MANUFACTURES, MINES, AND QUARRIES FOR 1908.

The Russian ministry of finance undertook in 1908 a census of all the manufacturing and mining enterprises of the Empire, the preliminary results of which were recently published in the official journal of the ministry in an article by V. E. Varzar, who had charge of the census. The following is a brief summary of the material there presented, accompanied by a few comparisons with the data on American manufactures and mines for 1909.

The Russian census was taken by factory inspectors and other government officials who had other duties and received no special compensation for their work on the census. The total cost of the enumeration and the compilation of the material was only $15,000. For that reason it is rather probable that only the larger establishments were included in the enumeration and that to that extent the results are not comparable with those of the Census of the United States. This supposition is supported by the fact that while in the United States the average number of wage earners per establishment is 26.3, the Russian statistics show an average of 67.6. Nevertheless it may be worth while to present a few of the items as they appear on the face of the returns for the two countries.

	Russia, 1908.	United States, 1909.
Number of establishments and operators	39,494	294,355
Horse power	2,255,000	23,483,000
Number of wage earners	2,668,875	7,733,217
Wages	$335,706,000	$4,040,869,000

The figures indicate that while the number of establishments included in the census of the United States is about seven and one half times as great as the number in Russia, the amount of horse power used is about ten and one half times as great, the average number of wage earners about three times as great, and the total wages paid more than twelve times as great in the United States as in Russia.

The Russian census relates to the calendar year 1908, except in the case of industries which operate only in the winter, the data for such industries applying to the season 1908–1909. Territorially the census covers all of European Russia, the Caucasus, Siberia, and Russian Central Asia. The total value of the products, which in the Russian figures apparently does not include manufacturers' profits, was $2,453,251,000.

Some of the principal industries enumerated were as follows:

Food products subject to excise tax, with 4,905 establishments, 293,868 wage earners, and a value of product of $443,784,000. This includes 342 state whiskey stills with 30,541 employees and a product valued at $172,463,000.

Food products, not subject to excise tax, with 3,043 establishments, 92,889 wage earners, and $337,709,000 worth of product.

Foundries, steel mills, and railway repair shops, with 2,103 establishments, 333,886 employees, and a value of product of $249,155,000.

Other metal works with 1,517 establishments, 135,115 wage earners, and a value of product of $48,707,000.

Slaughtering and meat packing, with 1,153 establishments, 62,858 wage earners, and a value of product of $79,621,000.

Wood products, with 1,902 establishments, 93,744 wage earners, and a value of product of $59,755,000.

Paper mills, with 1,333 establishments, 88,008 wage earners, and a value of product of $63,445,000.

Woolen mills, with 1,037 establishments, 149,848 wage earners, and a value of product of $112,673,000.

Cotton mills, with 986 establishments, 512,886 wage earners, and a value of product of $464,248,000.

Chemical products, with 477 establishments, 64,875 wage earners, and a value of product of $88,196,000.

The total number of mine and quarry operators was 20,037, with 615,791 wage earners, and a value of product of $323,254,000. The most important mineral product was oil, the value of which amounted to $105,834,000.

A comparison with a previous census shows that the number of establishments increased but slightly, from 39,029 in 1897 to 39,494 in 1908; but the value of products increased from $1,419,550,000 to $2,453,251,000 and the number of wage earners from 2,098,200 to 2,668,875 in the same period. Thus the value of product per establishment increased from $36,400 to $63,750, the average number of wage earners per establishment from 53.4 to 67.6, and the value of product per wage earner from $675 to $905. This increase in the productivity of the wage earner is due in part to the increased cost of raw materials, but principally to the progress in the methods of production.

E. A. GOLDENWEISER.

"*Wages and Family Income in the Village of Lonsdale*," by Carol Aronovici, Ph. D. Director of the Bureau of Social Research of New England. Reprint from the Annual Report of the Rhode Island Bureau of Industrial Statistics, Part 2, 1911. pp. 31.

In this reprint the author has attempted to present a picture of the wages of the workers in Lonsdale, Rhode Island. The total population of the village is 1,392, and of these 591 are reported as gainfully employed. The information was obtained by a house to house canvass made during

the months of November and December, 1910. The population was distributed according to sex, age, nationality, and employment.

A number of tables are shown which give the earnings of the working population classified according to sex, age, and nativity. Since the investigation covered but two months and except in those cases in which the difficulties of a foreign language made it impossible to obtain accurate information from the first visit, none of the families were visited but once. This would give the rate of earnings at a point of time, but the great factor of regularity of employment is entirely overlooked. The important figure in wage statistics is the yearly earning of the person or family. This cannot be obtained from a canvass of this nature but must result from an intensive study of households throughout the year or else must be made by consulting the pay-roll of the employers. It is interesting to know the the amount earned by the people of Lonsdale in one particular week but this is an insufficient basis for a study of individual or family earnings.

The number of persons visited in this enumeration was also too small to form any scientific average of wages. There were only thirty females in the village between the ages of fourteen and fifteen, and thirty-five between the ages of sixteen and seventeen, and yet in one table provision is made for twenty-eight groups and the average weekly wages are computed for these females in fourteen groups. Averages based upon such insufficient data possess but small value. The report undoubtedly gives, in many respects, an accurate picture of Lonsdale. The small number of cases used in the determination of the averages would warrant their use only with considerable caution.

Wm. B. Bailey.

Yale University.